Psychopathic traits in community samples: An examination of the relationship between psychopathic traits, disgust sensitivity, neurocognitive dysfunction and consensual sadomasochism in subclinical samples.

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Dedications:

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This thesis is dedicated to my father, John H. Bent.

Abstract:

Psychopathy is currently conceptualised as a personality disorder that results in cognitive, neurological, affective deficits, behavioural problems, criminal behaviour and recidivism. Psychopathy is most often associated with the offending population, and as consequence, psychopathy based research has been dominated by examination of the male, offender psychopathy. Consequently, what is currently conceptualised regarding psychopathy is biased toward this particular psychopathy sub-type. Recent research provides evidence that psychopathy is heterogeneous, dimensional construct found in a varied populations and age groups. The deficits so often associated with psychopathy may vary based on the sub-type of psychopathy this includes subclinical subtypes of psychopathy that seem to be present. Consequently, what is understood about psychopathy including the assumptions regarding affective, neurocognitive, deficits, higher risk of violence, including sexual violence, and other assumptions may be dependent upon the sub-type of psychopathy or preponderance of psychopathic traits present.

External correlates associated with psychopathy have been examined in non-clinical samples to examine how aversive emotion, disgust, and atypical sexual fantasy and practices, in the form of consensual sadomasochism may be related to psychopathic traits as measured by the PPI-R.

Chapter 1. Introduction

1.1 Psychopathic traits in non-offenders: Identifying the research issues

Psychopathy is a personality disorder that has baffled and fascinated clinicians and researchers for centuries (Ross, et al. 2008). The psychopath has been described as an individual who fails to appreciate social norms, defying laws and social conventions, acting on their impulses and whims at the expense of others (Cleckley, 1946). Psychopaths are described as liars, manipulators and connivers; they are said to engage in this behaviour for personal gain and as a consequence they are describe d as parasitic (Hare, 1993). Their behaviours are seemingly precipitated and exacerbated by emotional deficits such as the lack of guilt, remorse, shame or fear of reprisal that prototypically the psychopath does not experience (Glenn, et al. 2009). Psychopathy is most often associated with criminality (Edens, et al. 2010). Current research suggests that psychopaths are generally prone to instrumental violence, that is, violence for the sake of personal gain, as opposed to violence as a consequence of self-defence and/or fear (Blair, 2010). In addition, criminal versatility and much higher rates of recidivism are associated with psychopathy in offending populations (Blair, 2010). The aetiology of psychopathy remains unknown and there is little empirical research to suggest which treatments may be most beneficial; often it is assumed that the psychopath is untreatable (Jalava, 2006). Of all the personality disorders it is the well-researched, yet remains poorly understood (Skeem and Cooke, 2010). In research, the psychopath is often identified as male, violent, dangerous and hopeless in terms of treatment or desistance (Mahmut, et al. 2007). With regards to severity of crime, psychopaths are

often associated with the most extreme forms of crime, including serial/sexual murder and rape (Kirsch and Becker, 2007). They are believed to be more prone to sadistic tendencies because of a combination of psychopathic traits including impulsiveness, cold-heartedness, callousness and a lack of empathy (Kirsch and Becker, 2007).

1.2 Categorical versus dimensional structure of psychopathy

Based on the above descriptors, it would seem that the psychopath would be easily identified from other personality disorders and indeed from normal personality, however, there is actually substantial difficulty in identifying and diagnosing personality disorder, in general, and this is said to be particularly applicable to psychopathy (Blackburn, 2009; Cooke and Skeem, 2010). There are several reasons for this. One issue of particular import to psychopathy based research is the categorical versus the dimensional approach to personality disorder (Livesley, 2007). The DSM-TR-IV (APA, 2000) Axis II disorders are presented as unique categories. In biological terms, these categories would be known as a taxon. A taxon or category is unique and comprises a mutually exclusive set of characteristics that identify the taxon or category (Livesly, 2007). For example, narcissistic personality disorder (NPD) and avoidant personality disorder do not seemingly share traits. The narcissist is social, gregarious, and extroverted. The avoidant is asocial, fearful of rejection, introverted, and as the name implies avoids social interaction due to their extreme insecurity (APA,

2000). These disorders could not, superficially, seem more dissimilar. However, both disorders share numerous traits. Poor self-esteem and insecurity are key features of both disorders (APA, 2000); however, the outward manifestation of this is differentially projected with the narcissist presenting what they believe to be a well-adjusted, likeable façade, and the avoidant experiencing extreme difficulty with often the most basic of social activities. Both disorders share features with normal personality; for example, extroversion and introversion, but again, differentially (APA, 2000). The

narcissist might present as extremely extroverted and even domineering, and the avoidant would present as extremely introverted and retiring. These disorders present as opposite ends of a continuum of the personality trait spectrum, with underlying symptomology that is actually, shared; low self-esteem and insecurity. This helps to it illustrates that personality disorders do not represent unique categories, easily differentiated from one another, even when, superficially that would seem to be the case. According to Huprech and Bornstein (2007) and Livesly (2007) the traits associated with personality disorder are represented in normal personality but often in maladaptive ways. They are not traits exclusive to a personality disorder or even a group of personality disorders. As Blackburn (2009) also discussed, the traits associated with personality disorder are not exclusive to that personality disorder, again, implementing a categorical system of personality disorder becomes problematic if the traits associated with personality disorders are not mutually exclusive but rather part of a continuum of traits manifest in normal personality as well as personality disorder (Livesly, 2007). The traits associated with personality and personality disorder present on a continuum or dimensions and the traits may not manifest in the same degree within the same personality disorder which further leads to difficulty in conceptualising and diagnosing personality disorder and indeed, identifying psychopathy.

Psychopaths may present with symptoms quite different that are part of a cluster or group of symptoms associated with psychopathy such as emotional coldness, lack of guilt or shame, dominance and manipulativeness but also law abiding, and gregarious (Hare, 2003). A charmer, who will use others to obtain what they want, rather than resort to violence as a means to an end. In fact, some psychopaths will be markedly different from one another but both may be 'classified' as psychopaths. For example, a psychopath may also present as particularly anti-social individual; impulsive, violating

social rules and norms; including engaging in instrumental violence to achieve goals. They may have a lengthy prison record that varies in the scope and severity of the crimes they engage in. They will not seem to learn from experience or punishment, leading to a life-time of criminal behaviour and activity. It is difficult to understand why there are such striking differences in individuals who may be classified as psychopathic. However, the system by which clinicians and social scientists may classify individuals as disordered may actually contribute to some of the confusion about psychopathy.

Livesley (2007) suggests that classifying or categorising is a useful clinical and diagnostic providing the underlying dimensions are carefully considered. He cites numerous examples of research that providing support for assessing the underlying structure of these disorders are better understood by considering the dimensional nature of the traits associated with the disorder. That is, the extent to which specific traits associated with the disorder are manifest in the individual, and developing a super and subordinate cluster of traits to measure via a continuum from mild to extreme. Livesly (2007) cautions, however, that experiencing one or two traits associated with a disorder to an extreme does not necessarily denote personality disorder.

The reason for the diversity of presentations of psychopathy may be due to varied sub-types of psychopathy, originally proposed by Karpman (1941). Karpman suggested that there are sub-types of psychopaths that vary in the severity and presentation of their symptoms. Karpman suggested that there are two variants of psychopath: the primary psychopath, who exhibits the emotional lability often associated with the disorder, in particular a lack of fear or anxiety, guilt or remorse for their actions that has a unknown aetiology but has been theorised to be genetic, and the secondary

psychopath, closely associated with the anti-social traits associated with psychopathy and Antisocial Personality Disorder (APD) including criminality, poor socialisation, violence, recidivism and Karpman theorised may be the consequence of a neglectful upbringing.

Current research that explores psychopathy has provided evidence that psychopathy is a heterogeneous construct that includes diverse subtypes and dimensions (Miller, et al. 2010) and is not a unitary categorical structure, or taxon, that would imply a unique group with unique traits and features exclusive to this particular group (Skeem, et al. 2007). DelGaizo and Falkenbach (2008), Ross, et al. (2008) and Skeem, et al. (2007) conducted research with both offenders and non-offenders to determine if primary and secondary sub-types of psychopaths could be differentiated. In each study, there was evidence for primary and secondary sub-types of psychopaths, and that these sub-types exist in both offending and non-offending samples. Skeem et al. (2007) research with offenders suggested that secondary psychopathy in offenders actually shares fewer traits with the prototypical conceptualisation of psychopathy, the Cleckley/Hare model, than primary psychopaths. In particular, the lack of anxiety and neuroticism associated with psychopathy was actually not present in secondary psychopaths. DelGaizo and Falkenbach's (2008) study provided evidence for differing emotional experience with primary psychopaths demonstrating greater positive emotions and secondary psychopaths experiencing more negative emotions, including fear, anxiety and sadness, again not prototypical of the classic psychopath, unless considered as a sub-type described by Karpman (1941).

Research and theory promotes the notion of psychopathy as a heterogeneous, dimensional construct which includes sub-types of psychopaths ranging from high functioning individuals who are not criminals and are seemingly well-adjusted in terms of their ability to socialise, work and avoid criminality. Heterogeneity denotes

variety and diversity. An individual may display several key traits associated with psychopathy, such as compulsive lying, manipulativeness, and superficial charms to a particularly severe degree, yet another may display all the traits associated with psychopathy to a less severe degree, whilst yet another may display a combination of mild, moderate and severe exhibition of psychopathic traits and all may be deemed psychopathic by clinical standards. Furthermore, there are many so called 'normal' individuals that may display several traits associated with psychopathy, that while not sufficient to warrant a diagnosis or possible treatment, suggests that psychopathic traits can be found in normal samples to an extent that may be relevant for research into the construct of psychopathy, even if not clinically significant (Mahmut, et al. 2007; Skeem and Cooke, 2010; Lilienfeld, et al. 2012). Further on to this point, traits associated with psychopathy are often found in other personality disorders, such as Narcissistic Personality Disorder (NPD) (Blackburn, 2009), Anti-social Personality Disorder (APD) (Coid and Ulrich, 2010), as well as normal personality suggesting dimensionality, not a taxon (Livesly, 2007).

In spite of considerable research conducted to explore psychopathy, it remains poorly understood (DelGaizo and Falkenbach, 2007). Mahmut et al. (2007) argues this is a consequence of a focus on the offending, male, North American psychopath to the exclusion of other samples such as non-offenders, females, and juveniles. Similarly, DelGaizo and Falkenbach (2008) suggested that by focusing on psychopathy as a unitary taxon, rather than a dimensional multi-factor construct may have led to inconsistent findings in research that explores emotional deficits in psychopathy. More broadly speaking, Cooke and Skeem (2010) argue that psychopathy based research has been hampered not only due to an emphasis on the offending psychopath, but because the nomological network of psychopathy has unintentionally been disregarded or altered to better reflect the traits measured by the PCL-R rather than the original Cleckley/Hare model. A nomological network according to Cronbach and Meehl

(1955) is a theoretical framework that includes the observations and empirical analysis of a particular construction that combined provides evidences for the existence of the construct. Essentially measures like the PCL-R, as well as self-report measures of psychopathy should, in theory, be able to provide evidence for the clinical observations of psychopathy compiled by Cleckley and Hare, known as the Cleckley/Hare model.

At one time there was a debate about taxonomy versus the dimensional construct of psychopathy (Book and Quinsy, 2004), however, the argument has shifted away from whether psychopaths make up a unique group of individuals with unique characteristics exclusive to this group, identified as a taxon to acceptance that psychopathy is a heterogeneous, dimensional construct where the characteristics are shared with a variety of other personality disorders as well as normal personality, albeit, most often, but not always, in a maladaptive way. More recent research and inquiry into the assessments used to measure psychopathic traits as well as those used to measure more general personality traits provide evidence for diverse sub groups of individuals that display clusters of psychopathic traits. This includes traits like narcissism and Machiavellianism (Miller, et al. 2010). Lynam and Widiger (2001) cited by Miller, et al. (2010) point out, again, that there are a number of personality traits associated with psychopathy that are featured in other personality disorders. Further, they point out that in addition to the two and four factor models of psychopathy there is also a three factor model suggesting that psychopathy is heterogeneous not homogenous. Finally, they also add that there it is relatively common for individuals who present with symptoms of one personality disorder to also demonstrate features of another, suggesting that personality disorders are not homogenous, but heterogeneous disorders and that the features can be shared across personality disorders. Coid and Ullrich (2010) proposed that psychopathy may be a more virulent form of Antisocial Personality Disorder (APD), rather than its own disorder, however,

they acknowledged substantial research limitations including anomalies in the use of the PCL-R and possible bias on the part of their research team resulted in incorrect diagnosis, as well as influences of other assessments for APD colouring their interpretations. It is more likely that the participants presented with symptoms of both psychopathy and APD, and the team, due to their inexperience, potential bias, and incomplete administration of the PCL-R committed diagnostic errors. Overwhelmingly the literature promotes APD and psychopathy as similar disorders that share features, but the emphasis remains on personality and affective issues with psychopathy and behavioural issues with APD (Coid and Ulrich, 2010). As Miller, et al. (2010) point out, the DSM-IV indicates that there will be co- variance of traits associated with one personality disorder present in personality disorders. In fact, many individuals diagnosed with one personality disorder may actually meet the criteria for more than one PD. This may have been another failing of Coid and Ulrich's (2010) work. As the team that assessed and diagnosed participants was fairly inexperienced and required training, they may have failed to appreciate that individuals may present with both disorders

Ultimately, the prevailing view is that psychopathy is not a unique taxon. For psychopathy to be considered a taxon it would need to present as a unique typology, with features and traits unique to the taxon. Essentially, psychopathy would present as a personality disorder that has unique features and traits not seen elsewhere (Livesly, 2007). However, traits associated with psychopathy are not unique to the psychopath nor are behaviours associated with psychopathy exclusive to the psychopath. The problem with psychopathy is that it is dimensional and heterogeneous; the traits associated with psychopathy are shared with other personality disorders as well as normal personality. For example, the ability to lie and

manipulate is considered part of normal social development.Criminal versatility may be the purview of a particularly enterprising offender; that does not necessarily suggest they are a psychopath. The term psychopath therefore should denote a diverse group that share an excess of personality, affective and behavioural features that are considered unsavoury, socially unacceptable, and particularly self-aggrandising that are seemingly the consequence, in part, of neurological deficits (Blair, 2010). As the current conceptualisation has more of a clinical connotation, however, with reference to the research, the term psychopathic traits will be employed to denote a specific set of personality traits and affective features associated with psychopathy that have been examined in individuals not traditionally included in psychopathy based research and psychopathy will be used to refer to the clinical disorder.

1.3 Psychopathy

At present, psychopathy, defined as a cluster of personality traits, affective and neurocognitive deficits that often lead to aberrant, antisocial and offending behaviours (Patrick, et al. 2009). As psychopathy is identified as a personality disorder this suggests that it is life-long and resistant to change or intervention (APA. 2000; Salekin, 2002; Jalava. 2006). It is theorised that psychopaths and those who exhibit a preponderance of psychopathic traits have neurocognitive deficits (Cima and Raine, 2010) that lead to the exhibition of poor impulse control as well as an inability to correctly identify and process emotionally stimuli ranging from threat, guilt, empathy, remorse, morality and shame. Interestingly, some researchers have pointed out that so-called psychopaths tend to share a number of traits with individuals with Autism (Anckarsatar, 2006). Current research suggests dysfunction of the paralimbic system is associated with a number of the symptoms associated with psychopathy (Hare, et al.;

2008; Blair 2009). Similarly, research suggests atypical neurological morphology and functioning in individuals who score high on measures of psychopathy (Yang and Raine, 2008). While this research is in its infancy, there seems to be consistency in findings that suggest that there is a neurological basis for psychopathy as well as a preponderance of psychopathic traits in those not diagnosed as psychopathic, including research conducted with individuals who have developed "acquired psychopathy" as a the result of brain injury/disease (Kiehl, 2006). According to Glenn, et al. (2009) the dysfunction of the paralimbic system, particularly the amygdala is present in all factors of psychopathy. Their research relied on the four factor model of psychopathy (see Figure), which is atypical for most research, however not necessarily unreliable. They concluded that individuals with higher scores on the Interpersonal factor, which emphasises some the negative personality traits associated with psychopathy demonstrated the greatest deficits in amygdala functioning as it pertained to a moral decision making task. Further, their research suggests that individuals that scored higher on the Interpersonal Factor had higher levels of global paralimbic dysfunction including the medial prefrontal cortex, posterior cingulate and angular gyrus, regions regarded as responsible for affective experience. Dysfunction in these regions results in an inability to empathise, sympathise, and failures to include affect in decision making processes. Glenn, et al. (2009, p 3) concluded that, "findings suggest that reduced functioning in brain regions involved in the complex social process of moral decision making may be partly explain the complex social problem—the psychopath."

According to Hare (2005), the current conceptualization of psychopathy consists of a four-factor model outlined in Figure 1-1. It is important to point out that this model is based on research conducted using the Psychopathy Checklist Revised (PCL-R). The PCL-R (Hare, 1993) is a clinical assessment tool used to identify psychopaths in offending samples. A combination of clinical interview, case file examination and

clinical observations are used to assess if an offender is psychopathic. As it can only be utilised with offenders, and is most often used with male offenders and does not reflect non-offending psychopaths, female (though there is research to suggest it does a fairly robust tool for identifying female psychopaths) or juvenile offenders/non-offenders, nor does it include all the features of psychopathy, as some did not correlate strongly with the factors of psychopathy when using Item Response Theory. This included promiscuous sexual behaviour and many short-term marital relationships. In fact, this model of psychopathy is less referenced than the two factor model outlined in Chapter 1 which seems to be the generally accepted factor structure of psychopathy at the present time (). However, the debate over the factorial structure of psychopathy continues with the two factor structure most often being referred to rather than the more current four factor structure (). The disparity in the factor structures associated with psychopathy may likely be due to the dimensional nature of psychopathy (DelGaizo and Falkenbach 2008). Efforts to impose a precise factor structure may be hindered by the fact that psychopathy can and does often vary not only across but within samples. For example, the Four Factor structure outlined in the Introduction (see Figure 1-1) may be more consistent with a particular selection of offenders that were included in that research whereas the two factor structure which is more typically associated with psychopathy (Gray, 2011) (see Table1-2) in the current literature may be more appropriate with more diverse samples. Further research needs to be carried out on different types of samples to determine conclusively which factors may apply to which type of sample.

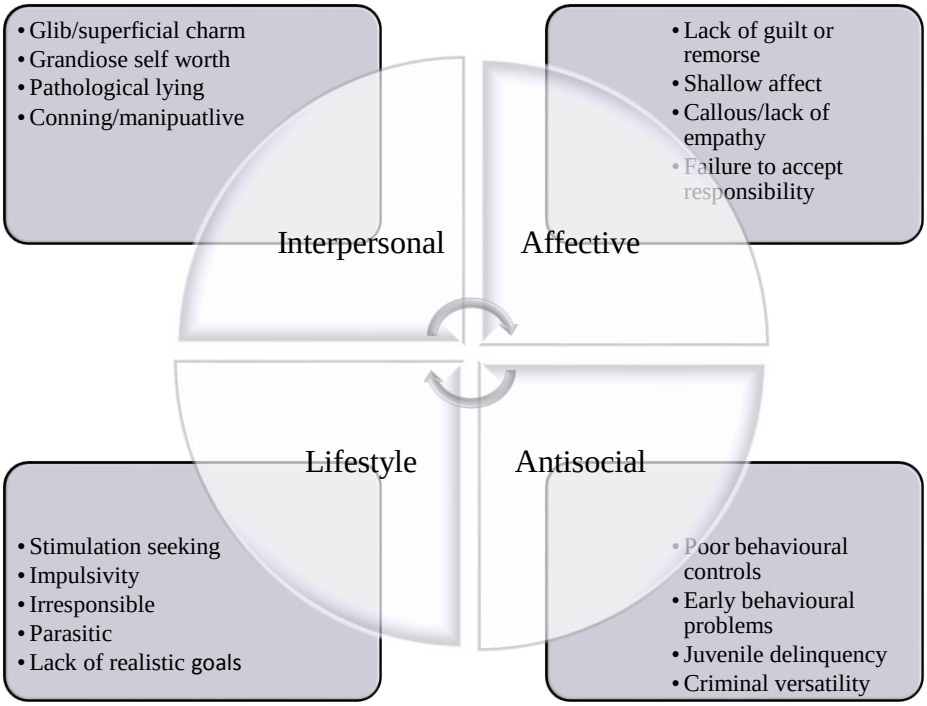

Figure 1.1 Four Factor Structure of Psychopathy (Hare, 2003)

Psychopathy remains poorly understood precisely because typically research is focused largely on male offending/clinical populations usually from North America, for which the PCL-R was originally designed (Mahmut, et al. 2007). There are certainly a number of valid reasons for such. Identifying offenders who meet the above criteria is often easier whilst they are in the prison and/or clinical settings. Identifying such individuals is considered critical to ensuring the safety of the public as offending psychopaths are considered much more likely to recidivate as well as being unresponsive to treatment (Hare, 2000) . However, to fully appreciate the construct of psychopathy, exploring both offender and non-offender is essential. What is currently known about the psychopath is drawn almost exclusively, from the most extreme presentations of psychopathy. Generalisations to other populations are inappropriate. As psychopathy is considered heterogeneous, and dimensional; whilst less explored, there is acknowledgement that sub-types, including non-clinical manifestations of psychopathic traits do exist (). It is essential to find out more about all manifestations of psychopathy and its traits if a complete picture of psychopathy as a construct is to be understood.

While providing a cohesive definition of psychopathy proved somewhat difficult, sadomasochism is even more problematic. First, Sadism and Masochism are both considered disorders according to the Diagnostic and Statistical Manual IV-TR (DSM-IV-TR) (APA, 2000) , as well as perfectly acceptable behaviours by the DSM-IV-TR as well as all in the Bondage Domination Submission and Masochism (BDSM) community (Langdridge and Barker, 2007). According to the DSM-IV-TR (2000) sexual sadism and masochism are considered paraphilias. Paraphilias are defined as mental disorders which present with "recurrent, intense sexually arousing fantasies, sexual urges, or behaviours involving: non-human objects, the suffering/humiliation of one's self or partner, children or other non-consenting persons." These fantasies/urges/behaviours must be present for a period of at least 6 months and must lead to clinically significant distress, or impairment which includes incarceration for offences with a non-consenting partner. However, it is acknowledged that providing these behaviours do not cause distress and are optional, not essential they are not disorders (APA, 2000). The definition is, admittedly contradictory.

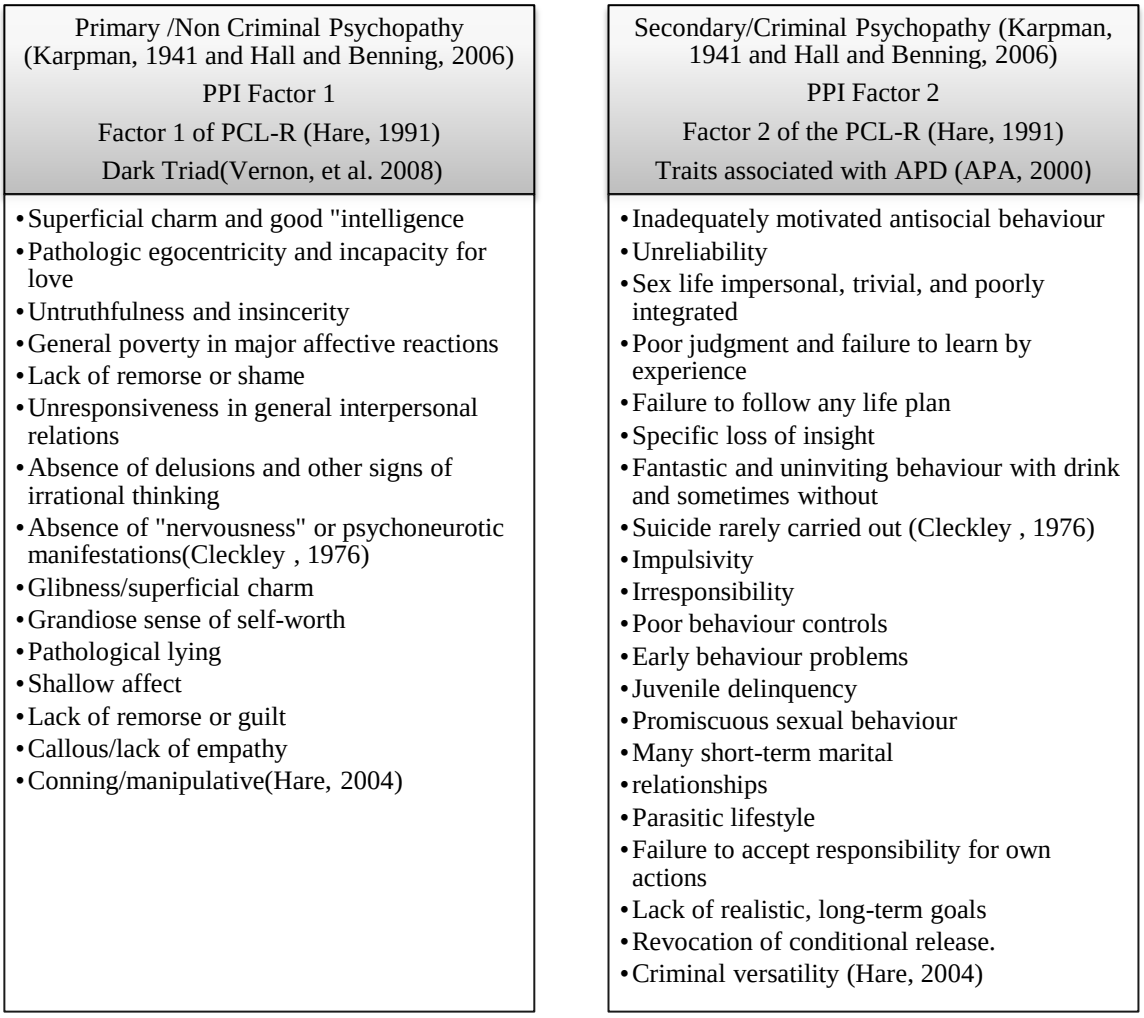

Figure 1.2 Two-Factor Structure of Psychopathy (Lilienfeld and Widows, 2005)

1.4 Affective deficits and the role of disgust in psychopathy

While research tends to support the presence of affective dysfunction among psychopaths, there have been findings that have been equivocal and it is believed this is because of the variation of psychopathy across participants (DelGaizo and Falkenbach, 2008). Precisely because psychopathy is heterogeneous and dimensional, not all will have all the same deficits. Nor will any deficits they experience be to the same extent, so while examining a group that may appear psychopathic; the specific traits associated with them may vary wildly resulting in atypical research findings. More specifically, understanding of the psychopath may often be hindered by the

emphasis on the most extreme forms of the disorder rather than exploring the diverse presentations of psychopathic traits in different populations. Additionally, not all aversive emotions have been studied in equal measure. The role of disgust has not been explored in depth in relation to psychopathy. Disgust is one of the least researched aversive emotions and when explored it is usually from the opposing perspective (Power and Dalgaleish, 2008). Individuals with a preponderance of anxiety and fear related issues including those with anxiety disorders and Obsessive Compulsive Disorder experience of disgust is often explored because disgust seems to exacerbate their symptoms. The role of disgust with regards to psychopathy remains largely unknown. However, it is critical to understanding psychopathy for two reasons. First, disgust is said to modify a host of behaviours from avoidance of contamination through to modifying sexual behaviours and because it is believed to share a role in the development of morality (Blair, 2009). Psychopaths by their very nature are believed to have a tenuous grasp of morality combined with attenuated experience of aversive emotions (Glenn, et al. 2009) and it is often suggested that the psychopath experience more deviant sexuality including deviant sexual fantasy than other populations, in part because of the attenuated experience of emotion, impulsivity and impoverished morality (Blair, 2009). Research conducted by Glenn, et al. (2009) demonstrated that individuals with higher scores on the PCL-R demonstrated reduced functionality in the amygdala during emotionally valence moral decision making tasks. Further, Glenn, et al. (2009) found that individuals who received particularly high scores on the Factor 1 traits associated with psychopathy, such as conning, manipulative and deceitful behaviours, exhibited reduced activity throughout the moral neural circuits. By extension, they have surmised that psychopathic individuals may, in fact, have greater difficulty appreciating morally complex situations and ultimately fail to make the more socially acceptable moral decisions as a consequence. Theorists argue that psychopaths are more likely to be sadistic. The reasons for this are

not entirely clear but it has been posited that the combination of lack of empathy, callousness, and inability to interpret or appreciate the emotions of others makes psychopaths more likely to be sadistic. Combine this with a lack of morality and an increased likely hood of deviant sexual fantasy and behaviour and it appears one has a fairly solid explanation for why psychopaths might be more prone to sadistic behaviour.

1.5 The theoretical relationship between psychopathy and sadism

Sadism may be defined as disorder that results in individuals deriving sexual pleasure and gratification from the humiliation, subjugation and intentional physical and psychological harm towards others (Krueger, 2009)

Psychopathy and sadism share numerous features including emotional detachment from others and the use of violence and intentional infliction of pain and a lack of empathy (Mokros, et al. 2010). As such, there is supposition that these constructs may be positively correlated and that the incidence of sadism will potentially be higher in individuals that are psychopathic (Mokros, et al. 2011). Research into this relationship is in its infancy and has been hampered by numerous difficulties (Krueger, 2010). Whilst Sadism has been part of the DSM since 1952, defining and identifying sadism in clinical or forensic samples has proven exceptionally problematic (Krueger, 2010). A systematic review found evidence that suggested that the conceptualisation and how to apply it in a clinical setting citing the work of Marshall and Kennedy (2003) indicating that clinician's use a combination of DSM and ICD diagnostic criteria, as well as 'idiosyncratic' criteria that did not adhere to a particular diagnostic system made it difficult to determine how clinician identify someone as disordered, much less how to treat sadism or conduct research with these types of offenders/patients.

There is criticism that paraphilias, including sexual sadism should not be considered mental disorder and that by doing so mental health professionals are exerting their control of what they constitute as normality onto others (Moser, 2006). According to Krueger (2010) this has particularly been the case when considering the inclusion of Sexual Sadism and Masochism in the DSM editions. Further, Krueger (2010) points out that outside of a forensic setting, a diagnosis of sadism or masochism was not reported when reviewing National Ambulatory Medical Care Survey in the United States a survey that reviews diagnoses of sexual disorders. It is unclear if this is due to patients not reporting any distress associated their fantasies/activities or that clinicians do not view their fantasies/activities as disorder, or a combination of the two. He adds that Sweden has recent stricken sadomasochism from the list of mental illness/disease to reduce discrimination against those that engage in consensual sadomasochism. As with psychopathy, it would appear that sadism seems to be dimensional; there is a spectrum of behaviours, fantasies and activities that range from consensual through to criminal and as a consequence not all those that engage in sexual sadism should be considered disordered, however, that is not to suggest the disorder of sadism does not exist or does not require investigation. As Palermo (2013) asserts, there are many 'faces' of sadism and the construct requires objective inquiry and investigation from the clinical, forensic and consensual perspectives.

Currently there is very little research that explores sadism from either the consensual or the clinical perspectives. Part of the difficulty in undertaken this research is largely due to weak definitions of the disorder (Marshall and Kennedy, 2003) and how the disorder sadism may differ from consensual sadism or sadomasochism (Palermo, 2013). Sadism and/or Sadomasochism are it consensual or the offending type requires empirical research and examination to better identify the different subtypes of sadism, how they might vary, and what role, if any personality, including personality disorder

may play. This includes the role of sadistic personality disorder (SPD, O'Meara, et al. 2011) as well as psychopathy.

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1.6 Synthesis of the key issues

There are a number of difficulties in undertaking research that comprises psychopathic traits, sadomasochism, disgust sensitivity and neurocognitive deficits in subclinical samples. Ideally these constructs would have precise definitions; however, there is often disagreement over a number of issues pertaining to each construct which must first be addressed. All are said to be heterogeneous, dimensional constructs, making the measurement and identification of each complex.

Psychopathy was one of the earliest identified personality disorders but remains the most difficult disorder to conceptualize for professionals in a variety of fields. Part of the difficulty is that psychopathy has a variety of definitions including medico-legal, as well as a pejorative term used within cultures and society (Kirkman 2008). Obfuscation is caused by the fact that there other constructs that share features with Psychopathy including Antisocial Personality Disorder (APD), and Narcissistic Personality Disorder (Blackburn and Coid, 1998). Most agree that Psychopathy is a disorder (Cooke, et al. 2004; Hare and Neumann, 2005; Blackburn, 2007), but some suggest that it is in fact a personality type (Book and Quinsey, 2004). These issues had led to the argument over whether or not psychopathy is a unique taxon or a dimensional construct. For psychopathy to be deemed a unique taxon, psychopaths would have to be "qualitatively different" (Marcus, et al. 2004) from "others" including other personality disorders, as well as "normal" personality. The fact that the traits associated with psychopathy exist as part of normal personality, as well as other personality disorders, and that psychopaths are present in the community as well as in the offending population, presenting with variations in symptoms and traits, suggests

that the construct is dimensional in nature rather than taxonic. As Livesley (2001) has pointed out, the issue of taxonomy versus dimensional construct, ultimately, may be an argument over how scientists have typically classified disorders historically, rather than the reality of the disorders themselves. The notion of sub-types of psychopathy, that similarly vary in severity and manifestation is also considered robust evidence for the dimensional construct of the psychopathy (Blackburn, 2009). This seems supported by the fact that other disorders share features with psychopathy and that psychopathy can range from mild to very severe in offending/clinical samples (Cima and Raine, 2009). Further, psychopathy is not exclusive to humans, but may in fact is present in some animals (Lilienfeld, et al. 1999). And finally, because psychopathy can be found within community samples as well as offending, though it is assumed to be rare, and that in such cases it may convey certain advantages to the individual that possess it again confirms that psychopathy is indeed dimensional, and may be considered a personality type through to a disorder (Osumi and Ohira. 2010). Add to this the fact that psychopathic traits are consistent with normal, albeit unsavoury personality traits, makes explicating disorder, disorders, types, subtypes, or merely being unfortunate enough to be deemed to have a preponderance of traits associated with the disorder becomes very complex.

According to the DSM-IV-TR (2000) Sexual Masochism is defined as "acts (real, not simulated) of being humiliated, beaten, bound or otherwise made to suffer"; including the presence of rape fantasies. Sexual Sadism, "involves acts (real, not simulated) in which an individual derives sexual pleasure from the pain and suffering of the victim". These two disorders are presented as seemingly mutually exclusive by the DSM-IV-TR. It is unclear if this is intentional, however. Several other authors have suggested that they are not mutually exclusive and those individuals, who enjoy sadism, may likewise enjoy engaging in masochism and vice versa (Hucker, 1997). However, this is inconsistent with several other sources which indicate that many individuals, who

engage in sadism, also engage in masochism, which makes the term sadomasochism more appropriate in many cases (Allgeier and Allgeier, 1995).

According to the DSM-IV-TR (2000) and previously Bancroft (1995), the overwhelming majority of individuals who engage in sadism or masochism are largely male. Bancroft went so far as to suggest that the only willing female participants were prostitutes paid to engage in such activities. Allgeier and Allgeier (1995) also note that males are far more likely to engage in paraphiliac behaviours than females. However, they point out that there is research that suggests both men and woman enjoy sadomasochism. Early theories of sadism and masochism, such as those offered by Kraft Ebbing (1887) suggested that sadism was typically a male disorder, while masochism was a female disorder (Allgeier and Allgeier, 1995). Subsequent research revealed that this is hardly the case. Kinsey. et al. (1953) found that approximately 22% of males and 15% of females enjoy some form of sadomasochism. The problem, however, with most of this research is that it is quite dated. Not only that, but views of sexuality and discussion of sexual fantasy and behaviour were more puritanical when much of this research was conducted likely resulting in very biased, misleading findings, including socially desirable responding by participants.

Herein, sadomasochism will be referred to as BDSM and it is loosely defined as acts of sexual nature that include deliberate infliction of controlled pain, humiliation, and/or domination/submission, as well as the use of restraints for mutual, consensual sexual gratification.

As with psychopathy, and sadomasochism, defining emotion is not a simple task. Theories abound about what emotions are, how they are generated, how they are experienced and perceived. The particular theoretical frame of mind one comes from, is it cognitive, behavioural, dualist, etc. will influence the definition proffered (Power and Dalgaleish, 2008). Also problematic is that there is a debate over whether or not

emotions are dimensional or categorical. As with the theoretical dissent, there are voluminous points of view regarding the categorical/dimensional view of emotions with many suggesting that emotions are distinctly different from each other and others proposing that there are a basic set of emotions from which all others are derived (Power and Dalgaleish, 2008).

The history of the study of emotion is complex, spanning numerous disciplines, and centuries. While it would be desirable to reflect upon the rich, dynamic history of emotion it would be beyond the scope of these thesis to do so, and so some of the more contemporary theories will be explored in greater depth including how this relates to psychopathic traits fantasy, and behaviour, rather than the school of thought from which it may be derived.

The emotion disgust is oft overlooked in research, though the reasoning is not entirely clear, as Power, et al.(2008) point out it is probably one of the easiest emotions to illicit in a laboratory setting with minimal effort or concern ethical issues. Power, et al. however, cite Miller (2004) who makes an interesting observation of why research into this emotion is lacking, "Disgust has been shunned as a subject of serious inquiry, no doubt in part because its unsociable stink threatens to transfer to those who study it (p. 2)."

Disgust is considered one of the six basic emotions alongside fear and love however, it has a complex dimensional structure that is influenced not only by biologic imperative to avoid incorporating that which is lethal, but also, culture, and individual differences (Power and Dalgaleish, 2008). As pointed out by (Moll, et al. 2005) disgust crosses several domains including animal reminder disgust, sexual practices, decay/death, contamination, particularly of bodily fluids, food borne disgust, and immorality. Disgust is said to modify a host of behaviours from avoiding something unpleasant such as a public toilet seat, to sexual practices one may deem cultural, religious, or

social taboo, such as incest and homosexuality, through to disgust and avoidance at the site of faeces shaped chocolate candy known as sympathetic magic.

Hyper vigilance in response to disgust is a common feature of many anxiety disorders and as such it would be expected that in groups that experience lower than average levels of anxiety such as those with a preponderance of psychopathic traits may experience lower levels of disgust. Not only that, but the lack thereof of disgust may in turn influence the types and varieties of sexual activities one might engage in including activities commonly associated with BDSM. Unfortunately, there is little research that explores these diverse, complex phenomenon Disgust is defined as a negative emotion that can be elicited by a variety of stimuli ranging from physical stimuli, including but not limited to decaying organic matter, bodily fluids, needles through to psychological stimuli, such as amoral behaviour, through to cultural taboos, including incest or paedophilia.

Add to the complexity of defining these structures identifying how some of these constructs may be linked can be equally difficult to conceptualise. For example, many suggest that psychopathy and sadomasochism are linked, most often suggesting the non-consensual type of sadomasochism; Not to mention difficulties in understanding of sadomasochism, be it consensual or forced (Marshall and Kennedy, 2003). However, the role emotion plays (or fails to) in relation to psychopathy is considered clearer; even if the definition of emotion remains elusive. Emotion is believed to modulate behaviour. Blair (2007) suggests that emotions, in particular disgust may moderate sexual interests and behaviours so it would seem reasonable to explore the role of disgust sensitivity in relation to psychopathy and atypical sexual fantasy, such as sadomasochism of a consensual nature. Part of the problem, however is that disgust is little researched particularly as it relates to the experience or appreciation of sexual practice. The mechanisms behind disgust are not fully understood, at present, so

explaining the role of disgust as it applies to sexual interest is not straightforward. In fact, this assumption is largely theoretical which is why research that examines the role disgust plays in terms of sexuality is essential as it may help to better inform theory. An in-depth discussion of the current theory regarding sexuality and disgust is explored in Chapter 5. Furthering this point, disgust is believed to play an integral role in the development of morality (Olatunjui and Sawchuck, 2005), something psychopaths are suspected to have an attenuated grasp of (Glenn, et al. 2009) so the relationship disgust and psychopathy may share, it would seem, should be explored in depth. Finally, neurocognitive deficits are believed to be causally linked to psychopathy. As a consequence of these neurocognitive deficits there is often an attenuated experience of aversive emotions associated with psychopathy and this may extend to the experience of disgust. This may, in turn, result in atypical sexual fantasy/practice such as an increased incidence of BDSM fantasy and practice. At least in theory, these things are posited to be related. However the research has not yet caught up to the theoretical assumptions across samples and for this reason it would seem necessary to explore this seemingly related constructs. Presently, psychopathy, emotional/neurocognitive deficits, and atypical sexual fantasy and practice have typically been studied almost exclusively in offending populations. These samples are typically male, generally Caucasian and hailing from North America (Mahmut, et al. 2007). While there is greater effort to expand the study of psychopathy across cultures and ethnicity, subclinical samples remain overlooked. So an examination of whether or not these assumptions apply to subclinical samples would be particularly beneficial and novel.

Identifying participants that are not clinically significant, but may still be relevant to the study of psychopathy is no easy task. In fact, at present there are no standardised protocols within research that determine what is ideal for a sub-clinical sample of possible psychopaths. Early studies sought to use a self-selection process that consisted

of placing advertisements asking individuals who had traits associated with psychopathy to consider participating in research that explored personality (Widom, 1977). Unfortunately this required that potential participants have a keen level of self-awareness of the traits they exhibited that are associated with psychopathy to volunteer and keen self-awareness may not always be the case among any research participants, much less those who may be more inclined towards traits associated with psychopathy. More recent research often, but not always, pre-screens participants, ensuring only the most extreme highs and lows are included in research (Osumi, et al. 2007; Osumi and Ohira , 2010). While it seems logical to omit participants that are not in an optimal range, it is necessary to keep in mind that research overwhelming supports the notion that psychopathy is a dimensional construct that varies tremendously manifestation and severity (Hicks and Patrick, 2006; Sheth and Pham, 2008) and eliminating a large proportion of the respondents will result in a limited understanding of the construct and the prevalence of traits associated with psychopathy. Current theory suggests that the manifestations of psychopathy and associated affective, neurocognitive, and behavioural deficits may be moderated by the sub-type of psychopathy (Sheth and Pham, 2008); exhibited by the individual and at present simply not enough is known about sub-types (Blackburn, 2009), as well as sub-clinical samples to exclude participants without investigation of the entire spectrum for fear of losing out on data critical to the understanding of psychopathy and its varied manifestations.

One final difficulty and a problem not dissimilar to identifying potential candidates for research with subclinical psychopathy are also how to identify candidates for research regarding BDSM. Examination of the literature that discusses Sadism as a crime one is immediately made aware of the difficulties in correctly identifying sadists from other types of offenders by clinicians and researchers (Marshall and Kennedy, 2003). Research into consensual sadomasochism relies exclusively on the individuals willing

to identify themselves as active in the BDSM community (Nordling, et al. 2006). At present there is no formal diagnostic tool for identifying sadism in offenders, nor is there an assessment tool for identifying consensual practices of BDSM for research purposes.

Another issue that must be dealt with is the use of self-report where psychopathy is concerned. The use of self-report is typically not recommended as individuals with a preponderance of psychopathic traits are considered too manipulative and conniving to be trusted to accurately self-report their personality traits, particularly those that may be viewed as unsavoury by others (MacNeil, 2006), however, Ray and Rivera-Hudson (2013) conducted a meta–analysis of the subscales used to detect socially desirable responding and malinger and found that some of the concern about threats to validity of the measures is unfounded. Participants with higher PPI-R scores were no more likely to respond in socially desirable ways than their counterparts. This is particularly beneficial result because outside of a forensic and/or clinical setting, the options for examining psychopathic traits often requires the use of self-report measures to ascertain the presence and preponderance of psychopathic traits. Similarly when measuring phenomena like emotion and sexual fantasy and/or practice, overwhelmingly the tools of necessity are self-report. It would therefore seem necessary to examine the use of self-report assessments with samples that may exhibit psychopathic traits outside of a clinical setting. Specifically examining some of the key features of psychopathic personality, such as lying, manipulation, cold-heartedness along with other features associated with psychopathy such as deficits of emotion and atypical sexual fantasy and practice so that a greater understanding of psychopathy can be achieved along with determining if self-report tools may be employed effectively for the identification of psychopathy, emotional deficits and atypical sexual

fantasy/practice in a variety of populations. What follows is a brief explanation of each of the key constructs explored and what the literature currently suggests regarding their interrelatedness.

Chapter 2. Literature Review

Psychopathy is a complex personality disorder that spans emotional, interpersonal, neurocognitive and behavioural research and theory. The aetiology of the disorder is unknown, but its impact is said to be felt in every facet of society (Hare, 1993). Psychopathy appears to be universal; descriptions of the disorder appear across cultures and societies (Lykken, 1995) inciting frustration, curiosity, fear and apprehension in all who have either had direct contact or hear the tales of those 'unfortunate' enough to have done so. What follows is a brief outline of the current conceptualisation of psychopathy from the Western perspective outlining some of the key issues in contemporary research including brief histories, where applicable, that will be addressed in relation to subclinical psychopathy. This is followed by an in depth examination of some of the key features associated with psychopathy including disgust sensitivity, neurocognitive deficits and BDSM fantasy and practice and how these constructs may manifest in subclinical samples.

2.1 Psychopathy

According to Hare (2000, p. 6), psychopathy has its roots in "several hundred years of clinical investigation and speculation by European and American psychiatrists and psychologists." While the aetiology of psychopathy remains unknown, Hare acknowledges that a host of factors seem to influence the manifestation of psychopathy. Biological factors, including genetics and neurology, environmental factors both societal and familial may contribute. It is an exceedingly complex

phenomena; the manifestation of which varies in severity and symptomology. In fact, Hare is quick to point out that psychopaths frequently fair very well in society, albeit to the detriment of others, but well within the confines of the law. At present, the non-offending psychopath or those who share a preponderance of traits with the psychopath but may not be formally diagnosed as such is poorly understood. This is largely because they are much harder to identify outside of a clinical setting. Furthermore, as psychopathy varies in manifestation, identifying it in a nonclinical sample proves substantially more difficult. As the construct is considered heterogeneous and dimensional (see Chapter 1, section 1.2.), it may not be appropriate to superimpose what is known about psychopathy from existing research with offenders to other samples. Identifying 'key features' may prove more difficult because the presentation of personality traits, cognitive deficits or affective lability may vary from one individual to the next, as it does in offending samples. The condition will likely be more subtle in presentation and may be overlooked entirely by most. It can become a matter of searching for a proverbial needle in a haystack. However, it is important to understand all the dimensions of psychopathy, not just those that are present in prison populations, if psychopathy is to be understood in totality.

Research and theories of psychopathy lend support for the traits of a typical psychopath with a fair degree of consistency. The psychopath is often regarded as someone incapable of empathy; exhibiting deficits in emotions, particularly negative affect such as fear and anxiety. Psychopaths are often described as consummate liars and manipulators. They are also notorious for being 'superficially charming' (Glass and Newman, 2009). However, there are others who suggest it is very difficult to pinpoint what a psychopath is and how one should be defined, or what traits should be attributed to them (Blair, et al. 2005). This likely stems from the fact that

contemporary research with different samples suggests differing conceptualisations of psychopathy ranging from a personality disorder (Book and Quinsy, 2004) through to a severe and dangerous personality disorder (Blair ,2010).

Over the past 200 years there have been myriad attempts to define and explicate psychopathy. Pinel (1787 cited by Patrick, 2007), is often credited as introducing the concept of 'psychopaths' to the world of psychiatry/psychology. He referred to the condition as 'insanity without delirium'. According to Hildebrand and de Ruiter (2004), the term psychopath was later coined by Schenider (1923) cited by Patrick (2007) As Kirsch and Becker (2007) point out, there are currently a variety of conceptualisations of what psychopathy is; and there is evidence to support these differing constructions which provides evidence for the dimensional nature of the disorder. Jalava (2006) suggests, that while there is not a consensus on what psychopathy is, there is a general agreement on the traits exhibited by so-called psychopaths and this is based on Cleckley/Hare model of psychopathy (See Table 1). In current literature psychopathy is most often identified as a personality disorder (O'Donohue, et al. 2007), though it is not included with other Axis II disorders in the most recent edition of the American Psychological Association's Diagnostic and Statistical Manual (DSM-IV-TR 2000). However, it is also been described as behavioural disorder (Cloninger,1978), and a developmental disorder similar, in some ways, to Autism (Blair, 2007). One particular similarity suggested is the notion that psychopaths, like individuals with Autism, may lack a complete 'theory of mind' (ToM) (Brune and Brune-Cohrs, 2006). The concept of ToM, developed by Premach and Woodruff (1978) is ability to assess the feelings or mental state of others, and is believed to be requisite for socialisation and development. However, Blair (2005) suggests that there is no evidence to support the notion that psychopaths have an inhibited TOM.

Often psychopathy and Antisocial Personality Disorder (APD) are used interchangeably within literature, which leads to confusion, as many insist that while they share similar features, they are different disorders (Blair, 2007). More recently, Coid and Ulrich (2010) suggest that APD is actually part of the continuum of psychopathy. This again suggests that psychopathy is dimensional and that APD is a less severe form of psychopathy however this research was plagued with issues including incomplete access to offender files and reports, recent training by staff which may have led to some biases in how they interpreted results of antisocial and psychopathy inventories . Similarly, psychopathy may be associated with 'Dangerous and Severe Personality Disorder' (DSPD) (Blackburn, 2007) which Blackburn (2007) points out is a nebulous construct with no clear definition, or precise methodology for diagnosis. Still others define psychopathy less as a disorder, and more as personality type, one that conveys certain advantages to the individual who possesses it (Coyne and Thomas, 2008). The lack of confluence actually provides the basis for demonstrating that psychopathy is indeed a heterogeneous, dimensional construct that varies in manifestation and severity, rather than a unique taxon which some have proposed, previously.

Current research lends further support for the notion that psychopathy is indeed dimensional, and that it can be found in both the general population and forensic/clinical populations (Guay, et al. 2007). For example, Cima and Raine (2009) found that the type of aggression psychopathic offenders engaged in varied based on the sub-type of psychopathy the offender was identified as exhibiting. Similarly, life satisfaction and intimacy for a community sample that scored high on measures of psychopathy also varied, again based on sub-type of psychopathy exhibited (Ali and Chamorro-Premuzic, 2010) . Psychopathy varied across the samples suggesting

diversity and dimensionality within the construct of psychopathy. According to (Livesley, 2001) the debate over the taxon versus the dimensional construct of personality disorder may be simply due to what is perceived to be what is easier for a clinician to work with in terms of diagnosing and clinical practice, and not due to something unique to a particular personality disorder. In fact, he suggests the categorical classification of personality disorder is actually one of the limitations of the DSM that requires modification as it inhibits understanding of personality disorder, as the categories tend to not reflect the realities and variance of presentation of personality disorders and current research seems to support this assertion. For example, Blackburn (2009) points out that the features associated with one personality disorder may likely be present in another and more importantly individuals do not typically present with symptoms of one personality disorder exclusively, rather, there is usually co-morbidity of some other personality disorder (see Figure2.1 for illustration), particularly for those presenting as psychopathic. For example, grandiosity is a feature of both psychopathy and narcissistic personality disorder. Selfishness and self-centredness are features of histrionic, borderline personality disorder and psychopathy. Criminality, violence, lack of remorse or guilt are said to be features of antisocial personality disorder and psychopathy (APA, 2000; Blackburn, 2009) Some of this overlap may be a consequence of the limited understanding of personality disorder and psychopathy as a construct or the categorical limitations of the DSM or a combination therein, which needs to be kept in mind (Livesly, 2007).

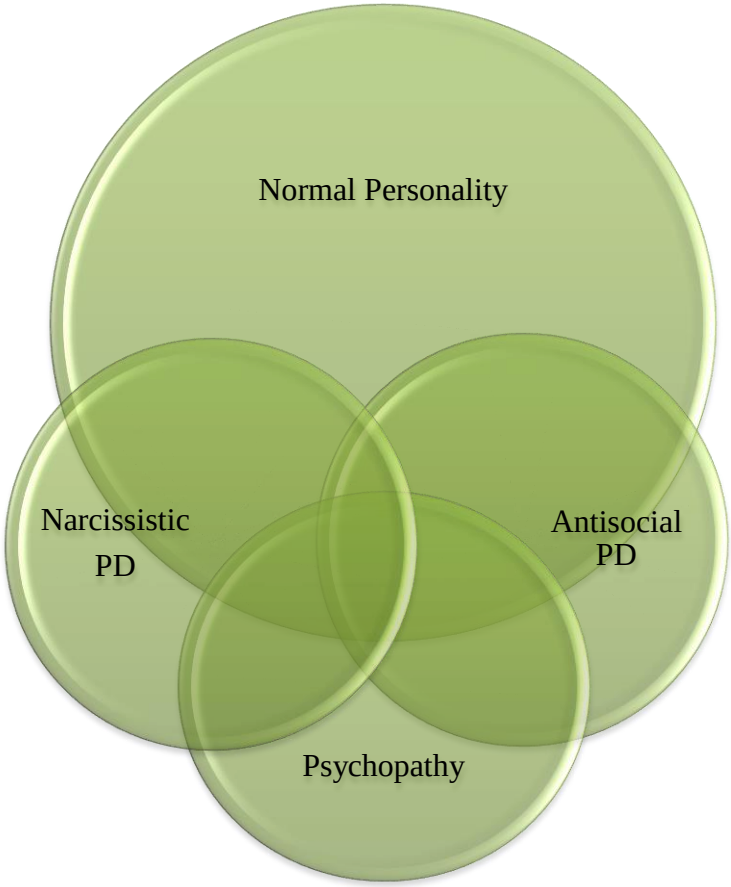

Figure 2-1 Venn diagram of proposed overlap between normal personality and personality disorder

The concept of subtypes of psychopathy, including differing patterns of traits and behaviour between sub-types, also complicates the situation greatly. Karpman (1941) is often cited as being the first to suggest that there are different sub-types of psychopaths which he dubbed idiopathic or primary (PP) and symptomatic or secondary psychopaths (SP). As the name implies, Karpman did not specify the origin of their psychopathy, he did however indicate that PP were more prone to the affective components of the disorder, whereas SP came about due to difficulties in environment and socialization, such as neglect, abusive parents, childhood victimization, etc. SP tend to exhibit more of the behavioural problems, associated with psychopathy including antisocial or criminal behaviour. This concept continues to receive support (Newman, et al. 2005) with PP most often being identified with Factor 1 of the PCL-R and SP most often being identified with Factor 2 (see Figure 2-1). Also, SP is often associated with APD as the traits of APD overlap with those of SP, including the

antisocial behaviours, impulsivity, violence, and criminality. It is not entirely clear how many sub-types of psychopathy may exist, as the manifestation of psychopathy is typical explored primarily in offenders and in research with sub-clinical samples often excludes participants that may be 'borderline', relying upon those with the most extreme of scores. This leaves a vast chasm in understanding of the construct and its' variability. While currently in its infancy, research that explores various manifestations of psychopathy can be broadly divided into gradations including offender high/moderate level of psychopathy, offender/non-offender or clinical/subclinical, and primary/secondary psychopathy and the possible traits associated with these specific subtypes. This is not to suggest that these subtypes are exhaustive, mutually exclusive, or even accurate depictions of psychopathy, but rather an acknowledgement of the diversity of psychopathy that is emerging in current literature and a need for greater recognition of the dimensionality of psychopathy. Not to mention these varied gradations also support Livesly's contention that the need to classify is largely the problem of the clinician and researcher and may not reflect the realities of personality disorder.

To combat or possibly add to the confusion, there are a plethora of tools available to identify/diagnose the presence of psychopathic traits/and or psychopathy in individuals. This includes the 'gold standard' of psychopathy measurement tools, the Psychopathy Checklist-Revised (PCL-R), which relies on clinical interviews, as well as criminal records, third-party accounts of the individual, and clinical inferences about personality traits Hare (1993). There are also a variety of self-report measures such as the Self-Report Psychopathy Scale (SRPS) (Levenson, et al. 1995) Psychopathic Personality Inventory-Revised (PPI-R) (Lilienfeld and Andrews, 2002), and Hare's Self-report Psychopathy Scale third edition (SPR-III) adapted by Williams, et al. (2007)

which is intended to measure the construct of psychopathy in non-offenders similar to how the PCL-R does, in offenders.

Part of the problem with using the current crop of assessments is that many of the self-report measures tend to focus on the anti-social behaviour, rather than personality traits associated with psychopathy (Mahmut, et al.2007; Homewood, and Stevenson 2007). There is also a complaint that the many of the measures do not fully capture the concept of psychopathy as it is currently defined using the Cleckley/Hare model (Uzieblo, et al.2007). This concern has been again expressed by Skeem and Cooke (2010) that the focus has become more about equating psychopathy with PCL-R measurement of psychopathic traits. Further, as Blackburn and Coid (1998) point out many of the these measures, including the PCL-R, measure traits that correlate with other personality disorders, as traits of psychopathy overlap with traits for Narcissistic Personality Disorder (NPD), Histrionic Personality Disorder (HPD), as well as APD. Further, these tools are not intended to measure sub-types of psychopathy. Though the PCL-R's two- factor model does seem to correlate with PP and SP (see Table 1. in Introduction p. 1- 14). More recently Hare (2005), had further identified four facets of the two-factor model, which he has applied to the PCL-R, in an attempt to identify individual differences between offender psychopaths. The two factor structure of psychopathy is currently the most often recognised structure for psychopathy. It is likely that as the understanding of the diversity of psychopathy develops, particularly as it applies to subclinical manifestations, this will change further but at present there is no certainty regarding the model or structure of psychopathy.

In addition to the diverse models, facets, sub-types and variations these traits are also present in non-disordered individuals who also exhibit traits associated with psychopathy raises concerns of how to identify psychopaths from non-psychopath

(Blackburn, 2007). In studies of personality these traits are often identified as the 'Dark Triad' which includes psychopathy, Machiavellianism (MACH) and Narcissism (Vernon. et al.2008) It should be noted that there are instances where some of the traits often associated with the 'Dark Triad', are viewed as attributes, not liabilities. Fearlessness, narcissism, and a lack of anxiety, as well as a lack of emotionality are all traits identified with a 'good' soldier, leader, surgeon, doctor, or fire-fighter, for example (Paunonen, et al. 2006). Current research suggests that having a preponderance of psychopathic traits can be quite advantageous (Jalava, 2006)The assumption that psychopathy equates with badness may be down to the pejorative view that many, including clinicians, have of psychopathy as a general rule and this view is not only unfair but also demeaning (Jalava, 2006). Consequently, a broad definition of psychopathy has been proposed herein. Psychopathy appears to be a heterogeneous, dimensional quite possibly a spectrum disorder, that is generally described as malignant in nature consisting of largely negative personality traits ,as well as affective, cognitive and neurological dysfunction. Psychopathy may range from a personality type through to a personality disorder which may predispose some towards inappropriate conduct including socially inappropriate behaviours, parasitic relationships, increased impulsivity, violence and criminality; conversely, some individuals will also present as high functioning, well-adjusted individuals and may be at a decided advantage being predisposed towards the traits associated with psychopathy.

2.2 Self-report of psychopathic traits: Validity, reliability and practicality

Presently, the only tools available for measuring psychopathic traits in non-clinical/forensic samples are self-report measures (Lilienfeld and Widows, 2005; Berardino, et al. 2010). For practical reasons, self-report is ideal. The assessments are

easy to administer and relatively easy to score and interpret providing the researcher is familiar with the construct of psychopathy and is reasonably skilled with employing psychometric assessments (Lilienfeld and Widows, 2005). Unlike forensic/clinical samples, it would not be possible to obtain information that would be available via a case file, criminal record or physician and/or carer's notes to explore and ultimately measure the traits associated with psychopathy in a community sample as one would do if they were employing the PCL-R to diagnosis psychopathy. Consequently, the self-report measure assessment is the only method for identifying a preponderance of psychopathic traits in sub-clinical samples (Berardino, et al. 2010). There are concerns about this, however. As with any self-report measure, positive and negative impression management on the part of participants can hinder obtaining accurate results on self-report assessments (Hare, 1993; MacNeil, 2006). Similarly, participants may feel compelled to respond to statements or questions in a socially desirable way to avoid appearing unpleasant to others (MacNeil, 2006). There are also some who will participate in research and for reasons unknown intentionally try to 'throw' the research off in some way, this is 'affectionately' known as the 'screw you' effect. Finally, self-report requires self-awareness, and participants may lack adequate self-awareness to participate meaningfully in research that requires self-report of some kind (MacNeil, 2006).

To combat some of these issues, most self-report assessments, including assessments of psychopathic traits include socially desirable and malingering scales. Sub-sets of questions that are designed to tease out which participants may feel compelled to respond consistently in a socially desirable way, and in contrast identify those who are intentionally malingering, or attempting to appear more negative than they actual are. Further, subsets of questions are included to ensure the participants are not engaging

in response bias due to boredom, fatigue or disinterest. There remains a particular concern about using self-report assessments with participants who may demonstrate higher than typical levels of psychopathic traits, however, research that has been conducted has demonstrated that individuals who of higher levels of psychopathic traits are not usually more inclined to malinger or to engage in socially desirable responding than other participants might and when they do they are frequently detected (Macneil 2006). In fact, it would appear that successful malingering is quite difficult for any respondents to achieve successfully (Macneil, 2006). As socially desirable responding is a possibility for all respondents, consequently, self-report is utilised with this in mind.

The greater issue, typically, with any self-report measurement is ensuring that it is valid and reliable (Miller and Lynam, 2011). That is to say is it measuring, effectively, the construct or constructs it is expected to measure and is it consistent in these measurements over time. There are a number of self-report tools available to measure psychopathic traits in sub-clinical samples and all continue to be rigorously assessed and typically some have undergone modifications to ensure they are measuring psychopathic traits, in particular, personality traits associated with psychopathy.

Cooke and Skeem (2010) recently expressed concern over an apparent assumption that underscores the use of the PCL-R the ubiquitous tool used to measure psychopathy in offending populations. They argue that there is a problem and potential danger in many assuming that "psychopathy is what the PCL-R measures." Hare and Newman (2010) responded to this assertion with agreement that the bulk of the research that explores psychopathy is overwhelmingly that of a criminological nature, even though, criminality is not central to the construct of psychopathy, and that ultimately, more research of diverse nature needs to be conducted to understand the nature of psychopathy and that no single measure of psychopathic traits fully represents

psychopathy. There was further disagreement between the experts, however, over the factorial structure of psychopathy as Cooke and Skeem (2010) have pointed numerous times, the factor structure promoted by Hare and Neuman (2010) is consistent with the factor structure measured by the PCL-R which again, either intentionally or unintentionally reinforces the notion that "psychopathy is what the PCL-R measures." (p. 456) Both agreed that the research conducted using the PCL-R is not representative of psychopathy in general, but rather, representative of many of the features of psychopathy often found in offending populations.

Cooke and Skeem (2010) argue that there is an overemphasis on offending behaviours within the PCL-R, thus creating a syllogism that criminality is always associated with psychopathy which is inconsistent with the original Cleckley model of psychopathy that Hare (1991) indicates was the 'inspiration' for the PCL and subsequent PCL-R and as criminality is not necessarily prototypical of psychopathy the emphasis is likely inappropriate. Again, Hare and Neuman (2010) did not disagree, but did not offer an explanation for why there is such an emphasis or what can be done to ensure that the conceptualisation or conceptualisations of psychopathy need not be identified exclusively the PCL-R to be considered accurate and reliable.

The other cogent point raised by Cooke and Skeem (2010) that needs to be reflected upon, in relation to all measures of psychopathy and psychopathic traits is that factor analysis may be used to develop a measure, and ultimately modify subsequent measures, however, "no statistical procedure will mechanically generate truth about psychopathy." (p.457) In fact, Cooke and Skeem (2010) raised concerns about earlier research conducted Williams and Paulhus (2004) on a self-report measure of psychopathy that they had completed factor analysis on. Upon completion it correlated strongly with factors associated with psychopathy as measured by the PPI, an early construct of the PPI-R, but was not as consistent with the two factor structure of

psychopathy then proposed by Hare (1993) represented by the PCL-R despite the fact that the factors captured associations with psychopathy such deviant behaviour, manipulativeness, overinflated self-confidence, and reduced anxiety. The assessment was instead retooled to make it measure items more closely associated with the PCL-R such as delinquency, disregarding the fact that it captured numerous traits associated with psychopathy. Ultimately, their concern is that research is becoming too focused on trying to replicate the PCL-R in some way and not actually measure the traits that underscore psychopathy and that there is far too great an emphasis on one measure and how it may be used to measure some features of psychopathy, some of which are not prototypical, and what is being lost from research as this version of psychopathy is being touted as somehow more valid than any other; as a consequence becoming the benchmark for what psychopathy is, even though some of what it measures seems to overemphasis traits not prototypical of psychopathy, such as criminality.

Cooke and Skeem (2010) close with an acknowledgement of the contributions the PCL-R has made to research including understanding of APD, criminality and psychopathic offenders, however, they insist that much more needs to be done to test "alternative conceptualisations of psychopathy. Diversifying the study of psychopathy and increasing its rigor can only lead to further insights about the construct."(p. 459) To this end it would seem necessary to utilise alternative measures in samples other than offenders to obtain a clearer, more accurate depiction of the psychopathy construct, from possible personality type through severe personality disorder.

2.3 Neurocognitive deficits

The neurobiological understanding of psychopathy has been buttressed by advances in functional neuroimaging technology that make it possible to not only explore the structure of the brain, but the metabolism of glucose and blood flow that underlie many neurological functions. It is assumed that increases in blood flow, or glucose

metabolism indicate which regions are engaged during certain activities. This science is, however, hardly perfected and it needs to be approached with caution (Evans 2010). Because the use of functional neuroimaging technology is expensive, and some methods, such as SPECT and PET rely on the use of radioactive isotopes that decay rapidly in the body, these methods are not widely employed nor are they feasible for use in large scale studies (Price 2011). This limits the scope of this research tremendously. Also, the participant groups in these studies usually consists of offending populations almost exclusively, however often there are attempts made to find non-offending controls, there has not been much done to explore potential neurological deficits in non-offending psychopaths (Selborn and Verona 2007). Even with keeping these limitations in mind, there is considerable evidence mounting that suggests that psychopathy is underscored by various neurobiological deficits and dysfunctions including inter-hemispheric dysfunction suggesting dysfunction of the corpus callosum, inter-lobe dysfunctions due to dysfunction of the angular gyrus, as well as dysfunction in the orbito-prefrontal cortex, temporal lobe, anterior cingulate, amygdala and hippocampus (Yang and Raine 2008; Dolan and Fullam 2009); effectively implicating much of the paralimbic system which is largely responsible for emotion regulation and behaviour (Kiehl et al. 2006; Yang and Raine 2008).

In addition to functional anomalies, studies suggest structural anomalies are often present in certain types of offenders who also exhibit traits associated with psychopathy (Blair 2010). These anomalies include reduced prefrontal grey matter, which is implicated in executive function including decision making and social interactions (Yang and Raine 2009; Blair 2010). This research suggests that some psychopathic individuals are at a disadvantage when it comes to neural capacity and as a consequence are more prone to the poor decision making and impulsive behaviour

they tend to exhibit as well as misinterpretation of social cues that leads to poor response modulation (Blair 2010). A sampling of some of the key contemporary literature is outlined while keeping the aforementioned limitations and caveats in mind.

According to Kiehl (2006) the neurocognitive deficits associated with psychopathy comprise three domains including affect/emotion, language processing, and attention. While the research, at times, is inconsistent (Gaizo and Falkenback 2008) there are definite patterns that have emerged suggesting that individuals with a preponderance of psychopathic traits experience difficult with a host of cognitive functions and there appears to be a correlation between these cognitive deficits and dysfunction at the neurological level. Specifically, most often regions of the paralimbic system have been implicated. Interestingly, some of these disparities in research may not be due to inconsistencies in research but rather lend further support for the dimensional construct of psychopathy. According to Hicks and Patrick (2006) variations in psychopathy and assessment of negatively valence emotion vary across the factors of psychopathy which may be why some research into emotional deficits appears equivocal. When analysed statistically, some forms of psychopathy do not share the same level of attenuated emotion as others. For example, if participants appear to have a preponderance of Factor 1 traits, they will demonstrate low reactivity to negatively valence stimuli whereas other 'combinations' of psychopathic traits may not. According to Munro et al.(2007) 'the anterior cingulate cortex is considered central to the integration of attentional, affective and visceral information.' Blair (2007) argues that the amygdala and ventromedial prefrontal cortex (vmPFC) are necessary for the 'integrated function' of these brain regions results in care based morality, which Blair defines as 'moral reasoning that concern actions that harm others.' He suggests

dysfunction, such as that found in psychopaths may explain certain anti-social behaviours. The following will give a brief overview of some of the current research findings across these domains.

Psychopaths are believed to suffer from attenuated and/or an absence of specific emotions, particularly fear, anxiety, shame, remorse and empathy(Hare and Neumann 2005). Furthermore, it is believed that psychopaths ineffectively process these emotions in others; often failing to recognize appropriate social cues such as facial expression (Blair 2005), and semantic processing of emotionally valenced words(Brinkleyet al. 2005). As a consequence, it is theorised, psychopaths often, but not always engage in behaviour that is antisocial due to their inability to successfully contextualize emotionally valenced stimuli (Cooke et al. 2004) . Additionally, individuals who are psychopathic seem to have attenuated impulse controls (Ray et al. 2009), making them more likely to engage in inappropriate behaviour because they fail to consider the cost/benefits of doing so; rather they act without thinking of the consequences. Similarly, psychopaths are believed to have difficulty with learning from experience (Coyne and Thomas 2008), so prior negative experiences do not provide schema for how not to behave in similar situations in the future. Finally, psychopaths are believed to have compromised morality which adversely affects moral judgments, reasoning and social interactions (Glenn et al. 2009) .

Currently it is theorised that there are neurological, neurocognitive and biological substrates for these deficits (Kosson et al. 2007). Kiehl (2006) proposes that there are global failures of the paralimbic system that are responsible for these deficits. The paralimbic system is comprised of several brain regions that when dysfunction are believed to underscore psychopathic traits including the "orbital frontal cortex, insula, anterior and posterior cingulate, amygdala, parahippocampal gyrus, and anterior and superior gyrus (Kiehl 2006, p.)." Kiehl points to studies of individuals who have

received damage to specific brain "circuits" that seemingly result in psychopathic traits. For example, individuals with orbital frontal lesions often show impaired ability to recognise emotionally valenced stimuli, in particular, facial expressions and tone of voice. Similarly, lesions in the posterior anterior cingulate have been known to result in a lack of emotion, hostility and irresponsibility often associated with psychopathy. Further, he points to research conducted with individuals with temporal lobe epilepsy who seem to engage in "psychopathic-like behaviour". Finally, he suggests damage to the amygdala may result in symptoms of psychopathy such as "aggression, impulsivity, poor behavioural controls, lack of empathy and emotional unconcern (Kiehl 2006, p.)."

Similarly, Yang and Raine (2008) discuss symptoms of psychopathy seem to be the consequence of paralimbic dysfunction. Research conducted with psychopathic individuals demonstrated emotional deficits in particular lack of startle reflex in response to aversive stimuli seems to be the result of atypical functioning of orbital frontal cortex, amygdala-hippocampus complex, anterior cingulate, and insula. They further posited that research conducted with individuals who have been diagnosed with APD, which shares symptoms with psychopathy, committed more errors on cognitive tasks including attention selection and response inhibition. Functional-neuroimaging studies suggest a correlation between dysfunction of the anterior cingulate cortex, dorsolateral prefrontal cortex, and superior temporal gyrus and these symptoms of psychopathy.

Kossonet al. (2007) have conducted several research studies to explore the relationship between psychopathic traits and neurological dysfunction including research to test theories that explore abnormal language processing in psychopaths as well as executive dysfunction in psychopathic individuals, which has resulted in the left hemisphere activation hypothesis. According to Kosson et al. (2007, p. 268), "

psychopaths are fully capable of processing linguistic stimuli under most conditions but exhibit state-dependent and relatively general cognitive dysfunction under conditions that place substantial momentary demands on left hemisphere-specific systems." As a consequence, when the left hemisphere is taxed to a greater than normal extent, psychopaths are more prone to make poor decisions, greater exhibition of anti-social behaviour/poor inhibition control and a reduction in the capacity to accurately interpret social cues. Similarly, research conducted to explore inhibited response modulation and passive avoidance learning in psychopaths similarly demonstrated dysfunction in the paralimbic regions of orbitofrontal and ventromedial dysfunction. Citing Patterson and Newman (1993) Kosson et al. (2007, p.) briefly explains the response modulation hypothesis which states that "psychopaths are generally responsive to immediate, salient contingencies but less responsive to subtle or peripheral contingencies; as a result psychopaths have difficulty modifying goal-directed behaviour to consider less salient information."

Building upon earlier biological frameworks for exploring primary psychopathic traits, such as that of Gray (1987) and Damasio (1994) van Honk and Schutter (2006), propose a neurobiological theory of psychopathy which suggests that there is a link between hormone imbalance which induces "motivational imbalances" within the brain. Specifically, a lowered hypothalamic-pituitary-adrenal (HPA) response and increased hypothalamic-pituitary-gonadal (HPG) response, which results in low cortisol and high testosterone provides the foundation for low punishment/high reward sensitivity at the subcortical level and also reduces communication between specific regions of the paralimbic system.

At present, there is no single unified theory that provides an explanation for why the psychopath exhibits neurocognitive deficits. Further, most research has focused on the

offending psychopath to the exclusion of other groups; not only that, functional neuro-imaging studies typically use small samples so generalising results is quite difficult beyond offenders, and even among offenders researchers must proceed with caution. Understanding how these results may apply, if at all, to other groups, including other clinical and sub-clinical subtypes with more specificity is needed. Also, there should be methods available that allow for larger scales studies to be conducted using a variety of samples. Currently, and with good reason, it would not be financially sound to attempt to conduct functional neuroimaging with samples that may only demonstrate a few psychopathic traits rather than individuals who demonstrate a variety of psychopathic traits or score quite high on measures, for example, but from a research perspective, excluding these individuals leaves the possibility that aspects of the disorder are being missed out on. As such, finding alternative means to research neurocognitive deficits that are cost efficient are important to expanding research into the construct of psychopathy.

2.4 Psychopathy and disgust sensitivity

In the last two decades substantial research has been conducted to explore the relationship between emotion and psychopathy. According to Muller et al. (2003, p) psychopathy 'is characterized by abnormal or deficient emotional responsiveness leading to disturbed social interactions and diminished ability to learn from punishment.' Research suggests that individuals with psychopathy experience reduced startle responses to aversive stimuli (Patrick et al. 1993) diminished autonomic response to aversive stimuli, (Osumi et al. 2007), as well neurological dysfunction and emotional dysfunction when presented with aversive stimuli. (Muller et al. 2003) Further, individuals with psychopathic traits often exhibit cognitive deficits when presented with emotionally valenced stimuli including failures to identify fearful or

angry facial expressions in others (Blair et al. 2004), misinterpret social cues, (Doninger and Kosson, 2001) as well as experience difficulties in affective/semantic processing of language (Blair et al. 2006).

This research suggests that psychopathic individuals have attenuated, or absent emotional experiences and responses, particularly when presented with aversive stimuli. This coupled with failures to appreciate or interpret the emotional states of others leads to behaviour that ranges from socially inappropriate, to antisocial and/or criminal behaviour. This research suggests a link between psychopathy and emotion. As such, exploring specific emotions may improve understanding of the emotional dysfunction experienced by psychopaths.

Kolb and Whishaw's (2010) neuropsychological definition of emotion; suggest that emotion is an 'inferred behavioural state', which they call affect. Affects result in 'conscious, subjective feelings about stimuli', and have many components. Panksepp (2003) likewise points out that there are many components to 'emotional processes including motor-expressive, sensory-perceptual, autonomic-hormonal, cognitive-attentional, and affective-feeling' which is echoed by Kolb and Whishaw (2010), For example, changes in facial expression, identifying such changes in others and responding, changes in heart rate, memories or ideas evoked by the stimuli, and expressing the feelings evoked are all part of the emotive process, which in turn may influence behaviour.

Disgust is a complex, dimensional emotion that has its roots in avoidance of food borne contaminates for survival purposes that has evolved to incorporate a wide variety of disgust inducing stimuli (Rozin et al. 2004). Disgust seems to be modified

and/moulded by a cultural (Olatunjui, et al. 2009), societal (Olatunjui and Sawchuck, 2005),and individual differences (Mataix-Cols, et al. 2008). There are several dimensions of disgust from animal reminder, through to moral transgressions that illicit a disgust reaction. A concise listing of the domains of disgust has been provided below (see Figure 2.4).

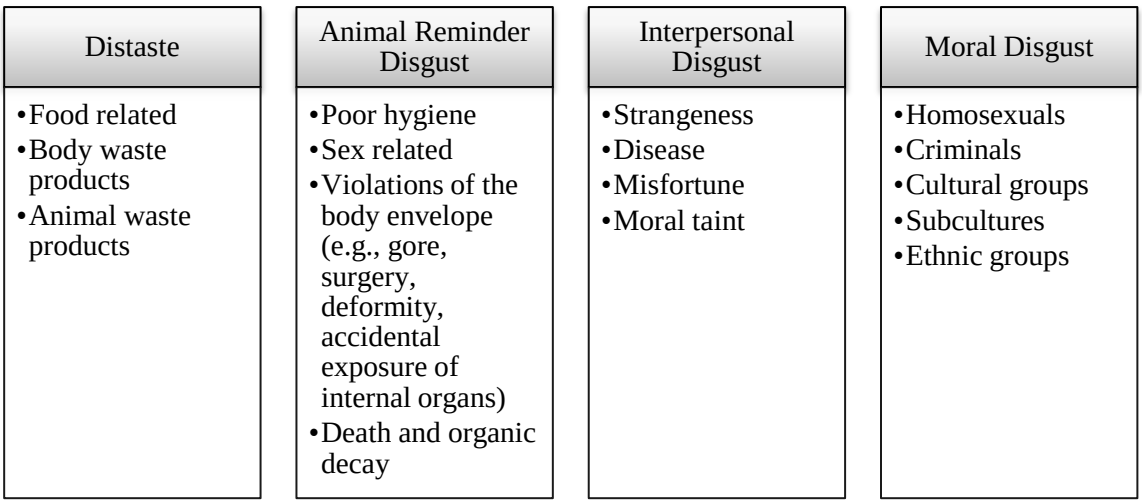

Figure 2.1 Domains of Disgust proposed by Moll, et al. (2005)

According to Moll, et al. (2005) these domains of disgust are a consequence of varied and diverse stimuli that may induce a disgust response in an individual. For example, they define distaste as a basic evolutionary response to stimuli which are perceived as bad tastes, core disgust may be induced by animals and their products and by products, this differs from animal nature disgust which acts as a reminder to higher order mammals, such as humans, of their more atavistic nature, as well as their mortality. Interpersonal disgust may be generated by those perceived as being different or lesser or contaminated in some way and in a not entirely dissimilar vein, moral disgust is elicited by contact with those that may corrupt the 'spiritual entity; due to their 'moral offenses'.

As an emotion, disgust may be unique as it not only serves to protect from contamination that is a very real danger, such as spoilt meat or blood borne pathogens, but it also has an ephemeral quality where individuals will avoid situations, behaviours and others they feel may somehow spoil their soul or being(Mataix-Cols et al. 2008). While disgust is considered driven by evolution, it is also driven by culture and society (Borg et al. 2008). What may be considered amoral in a particular culture can result in the same emotion as a decaying corpse and while the physiological responses to the stimuli may vary, the psychological responses do not just prove fascinating; they may very well be responsible for which behaviours are engaged in and which are to be avoided (Moll et al. 2005).

Disgust is often an exaggerated response in some psychological disorders such as contamination fears associated with Obsessive Compulsive Disorder (Olatunjui et al. 2007). Individuals who experience higher anxiety and fear, also typically respond with greater disgust sensitivity (Olatunji et al. 2007). Conversely, then, it might be expected that individuals who score higher on measures of psychopathy, where anxiety and fear are usually diminished, would similarly score lower on measures of disgust. At present, this area of research is lacking, not only in terms of how disgust may differ from other aversive forms of emotional stimuli but with regards to how sub-types of psychopaths may respond to such as well as whether or not disgust or a lack thereof might be responsible for atypical sexuality.

Early on in disgust research, Haidt et al. (1997) point out that there appeared to be a relationship between disgust and morality. This is not dissimilar to the assertion by Blair (2007) that disgust moderates 'moral' behaviour, in particular, sexual behaviour. Olatunji et al. (2008) theorises that disgust may also explain negative attitudes towards homosexuality, for example, due to a number of disgust related domain, including those who find homosexuality morally disgusting. Essentially, as individuals may

view the 'other', that is someone different from themselves as degraded, inferior and a potential source of pollution and contamination and therefore finds them offensive and disgusting. This type of response may be the basis for how individuals perceive sexuality and make judgments about what is acceptable and what is disgusting. However there is very little research into this phenomenon at present which is why further examination of the relationship between disgust and sexuality requires examination, particularly in those that may have an attenuated experience of disgust, such as individuals with a preponderance of psychopathic traits.

2.5 Psychopathy, disgust sensitivity and consensual sadomasochistic fantasy/practice

For the purposes of this research, consensual sadomasochism will be referred to as BDSM which Moser (2006) explains,

"BDSM is an acronym for Bondage and Discipline (B and D), Dominance and Submission (D/S) and Sadism and Masochism. (SM or S and M) It describes people (players) who eroticize bondage, a power differential, physical and/or psychological pain (sometimes called intensity). "

BDSM covers a host of activities ranging from the use of restraints through to flogging; the activities can range from light bondage to quite intricate forms of Japanese bondage, for example. The limits are confined to the individual players' tastes, interests, and imagination. The players are a diverse group of individuals who identify with varied aspects of this subculture, and roles are often interchangeable. Someone may be submissive in one type of play, but dominant in another, for example. Sexuality, gender, gender politics, and identity all play a role in how individuals identify themselves within the BDSM community and as the terminology can be quite

diverse it will not be touched upon in any greater detail. This conceptualisation is in stark contrast to the early DSM definition of sadomasochism that suggested sexual dysfunction. According to (Moser 2006) sex and sexuality, particularly alternative sexual practices are poorly understood and often are unfairly stigmatised as a consequence. Further, Moser points out that BDSM, in medical setting, is often viewed with suspicion. Often it is assumed patients who presents with marks/bruises from "play" that is sexual interactions that result in welts/bruising such as whipping, flogging, lashing, for example are in fact the result of abuse. It would be reasonable for a clinician to be wary, certainly. Doctors and other medical experts have a 'duty to care', so it is understandable that if someone is unfamiliar with the BDSM practices and is trained to care for illness and injury that this assumption is not uncommon. Combine this with the fact that the continuum of behaviours that BDSM is associated with can also be a disorder and that people who are victims of abuse may be prone to lying about the origins of their injuries(), this, again, is not an unreasonable assumption. How the continuum of behaviours associated with BDSM may or may not be related to the disorder of Sadism, require investigation and clarification.

DiGiorgio-Miller (2007) explains that much of the literature into atypical sexual fantasy/practices is often conducted from the male, adult sex offender perspective. As a consequence, research tends to support a relationship between "deviant" fantasies/practices with offending behaviour. Interestingly this is in spite of the fact that adult sex offending males also engage in "normal" fantasy, as well and the prevalence of "deviant" fantasy in non-sex offending populations is not known. Furthermore, this research also states that individuals who engage in "deviant" fantasy/behaviour tend to do so in response to negative emotional states including

feelings of rejection, anger, hostility, and loneliness as a flawed coping strategy. This cycle of negative emotion, followed by "fantasy" leads to patterns of "deviant" sexual behaviour, and ultimately offending behaviour. This leads to assumptions about the role negative emotions play in atypical fantasy/behaviour that has been deemed "deviant" in other samples. As a consequence, those unfamiliar with research limitations and the need to ensure that results are not generalised more broadly than individuals who are similar to the sample, at times, make erroneous assumptions about the role of atypical fantasy and practice they may deem "deviant" in non-offending individuals. For the sake of clarity, consensual sadomasochism will be referred to as BDSM, non-consensual, as Sadism, and throughout, atypical sexuality will refer to that which is statistically rare (as is currently understood to be the case), but not criminal including BDSM, whereas the term deviant will be used to denote that which is criminological in nature, be it fantasy or behaviour.

In clinical literature, the relationship between psychopathy and sadism is believed to be mediated by emotional deficits exhibited by both psychopaths and sadists; however, there has been virtually no empirical evidence to support this theory (Kirsch and Becker 2007). More specifically, the lack of empathy exhibited by psychopaths and sadists is believed to a key feature of both 'disorders'. Empathy, however is a particularly complex emotion; difficult to define, dimensional in nature and the deficits exhibited by both are believed to be for specific sub-types of empathy, while other forms of empathy appear to remain intact (Kirsch and Becker 2007). Further, there is some dispute over whether sadists fail to exhibit any form of empathy deficit, but rather respond to it inappropriately. That is, rather than empathise when their victim exhibits pain or distress, they derive pleasure from it(Batson et al. 1987; Kirsch and Becker 2007). The study of empathy, including deficits, is hampered by a lack of

confluence regarding the definition and measurement of empathy as a construct (Kirsch and Becker 2007). More recent research suggests that at a neurological level, empathy appears to have varied features and that different types of empathy are mediated by different brain regions. The neurological underpinnings for cognitive elements of empathy, such as perspective taking, vary from the emotional aspects and these are mediated by differing structures within the paralimbic system and damage to these regions adversely affects the ability to exhibit the full spectrum of empathy (Shamay-Tsoory et al. 2009). Similarly, preliminary research that explores the relationship between psychopathy and empathy suggest that while some forms of empathy appear to be intact, psychopaths exhibit deficits for other forms of empathy; however, it remains to be seen if this results in psychopaths being sadistic or sadists definitively being psychopaths. Nor does it justify the assumption that BDSM and psychopathy are similarly related.

While empathy remains elusive in terms of research, disgust sensitivity may provide some understanding into the relationship between psychopathy and BDSM. A recent functional neuroimaging study conducted by Stark et al. (2005) suggests that there is a relationship between disgust sensitivity and self-identified BDSM participation. Participants who identified themselves as active in the BDSM community responded to BDSM imagery favourably neurologically; that is the brain activation suggested that they viewed these images as erotic. Participants who did not identify themselves with the BDSM community showed neurological responses similar to when they were presented with images that were deemed 'disgusting'. Similarly, research conducted by Williams et al. (2009) found that there is a relationship between personality, particularly psychopathic personality traits, atypical sexual fantasy and behaviour with personality traits associated with psychopathy and BDSM. Determining what role, if any, disgust sensitivity plays with regard to BDSM and psychopathic traits may prove particularly fruitful.

2.6 Current research

As there is currently a greater demand for research with subclinical samples to aide in understanding of psychopathy and psychopathic traits, it is necessary to ensure the tools utilised to assess such traits exhibit reliability and validity. A systematic review has been undertaken to assess the validity and reliability of the PPI and its derivatives the PPI-R and PPI-SF, self-report assessment of psychopathic traits that is frequently used in research with subclinical samples. Considering the multi-faceted nature of psychopathy and psychopathic traits, the need for greater diversity in research participants, and greater consideration of theoretical assumptions regarding the relationship between psychopathic traits, emotional/neurocognitive deficits and atypical fantasies/behaviour it would seem constructing a number of studies that explore these diverse, yet interconnected constructs in research participant groups that have not received as much attention such as females, and those active in the BDSM community. Further, it seemed important to clarify that even individuals do not identify themselves as part of the BDSM community, research should be conducted to examine the frequency and variance of so called atypical fantasy and practice related to BDSM as this construct is identified as being positively correlated with psychopathy. Considering that some may simply be ignorant of the BDSM subculture but engage in activities that would be considered part of the BDSM lifestyle, anyway or because of the negative connotation associated with BDSM, some may feel ambivalent about identifying with such.

This research is novel in that it explores sub-clinical psychopathy in a diverse sample; often research explores psychopathy as it applies to non-offending males, but not females. Similarly this research explores psychopathy in terms of emotional/cognitive

deficits other than fear/threat stimuli, specifically disgust which is often neglected emotion in research in general, again using a more diverse sample than is typically presented in the literature. However, female respondents are well represented throughout, in terms of both fantasy and practice. Finally, rather than just examining the lowest and highest scorers on self-report measures of psychopathy, as is often the case in such research with sub-clinical samples this research does not pre-screen or exclude, in an effort to try and capture the full spectrum of psychopathy.

This chapter was intended to provide an overview of the current conceptualisations of psychopathy, disgust, sadomasochism from the clinical and the BDSM perspective; including how these constructs are theoretically tied together, along with examinations of seminal and current studies that examine, psychopathy, BDSM, neurocognitive and affective deficits to provide a rationale for the research that was undertaken for this thesis. Chapter 2 provides an overview of each study including methodology, while Chapters 3-6 examine the most contemporary research into each aspect of psychopathy under consideration, outline the research method, design, results and discussion for each research study with Chapter 7 providing a conclusions of the research findings including how effectively this research was at addressing some of the research problems and future areas of exploration of sub-clinical psychopathy.

Chapter 3. Methodology

3.1 Study I (Chapter 4)

As there is a necessity for research that explores psychopathic traits in samples other than offending populations exclusively relying on the PCL-R for measuring traits associated with psychopathy, other tools, in particular, self-report measures have been constructed to assess psychopathic traits. Ensuring they are both valid and reliable is essential to the future of psychopathy research. One method that can be applied, borrowed from the medical community and adopted and adapted for use in psychology is the systematic review. A systematic review of the validity and reliability of the PPI, PPI-R and PPI-SF have been undertaken to examine the research conducted ensuring that it is measuring traits associated with the construct of psychopathy in non-clinical and/or forensic samples.

In medicine, a systematic review provides a comprehensive review of a particular treatment or medical testing protocol that is conducted completing an exhaustive and compressive search of extant research literature based on a priori search criteria, including key research queries to be answered by analysing the literature (Torgerson, 2003). Psychologists have co-opted this methodology and applied an adaption to psychological treatments and testing procedures, including personality assessments to provide a comprehensive review of a particular tool, in this case the PPI-R to determine if it effectively measures psychopathic traits.

Admittedly this adaption will not be identical to a medical systematic review as the rigours of medical research vary from that of psychological research; however, wherever possible the procedures in place are as similar to those proposed for medical research to ensure robust, objective findings. The systematic review including research protocol was adapted from EPPI-Centre Methods for Conducting Systematic Reviews

(2010), as well as the work of Hemingway (2009), Woodward (2009) and Torgerson (2003).

A research protocol had been devised that provides a framework for how the a priori research question will be answered, including providing a detailed strategy for data searches, inclusion/exclusion criteria, quality and relevance appraisal, data extraction, and synthesis of relevant studies. The data has been analysed using a narrative empirical synthesis which includes tabulation of the data sets, a summary table of key findings and concludes with a critical review of the data.

3.2 Study II (Chapter 5)

As emotion is impossible to measure directly, self-report is often relied upon as a tool to measure individual's experience of particular emotions. However, this may be contraindicated for those who score highly on measures of psychopathy because the assumption is that a psychopath's experience attenuated levels of emotion, in particular negatively valenced emotion and will respond in a way that is social desirable so as to appear more typical; essentially faking good. The measurement of disgust is, as yet, little researched in terms of psychopathy. Disgust manifests across several domains and is said to modify behaviours and attitudes. Negative emotions are said to be deficient in those who exhibit psychopathic traits, particularly traits associated with Factor 1 of psychopathy, and the reasoning for this is said to be atypical neurological functioning and attentional deficits. An exploration of disgust and psychopathic traits has been undertaken that examines both self-report and neurocognitive functioning by using the Disgust Sensitivity Scale Revised (DS-R). The study includes an emotional Stroop to examine how participants respond to disgust related words compared with positive, aversive (threat-based, non-disgust) and neutral stimuli to determine what role the presence of psychopathic traits may play in the responses to disgust based stimuli. The purpose of this experiment is two-fold.

Identifying what, if any, deficits in processing of disgust based stimuli may be present in those who demonstrate higher than normal psychopathic traits is of particular interest, but also how well individuals are able to appraise their experience of disgust sensitivity has also been explored via comparison of self-report with emotional Stroop results. These results will not only inform understanding of psychopathy and possible emotional deficits but can provide information on how to operationalize disgust sensitivity via research study.

3.3 Study III (Chapter 6)

There is some theory to suggest that those exhibiting a preponderance of psychopathic traits are more inclined towards sadism and sadistic tendencies (Mokros et al. 2011) however, there currently is little empirical evidence to support this relationship. Rather, there is an assumption that those that engage in what are deemed to be crimes of a sadistic nature are also psychopathic and because these two constructs share some similar features, such as a lack of empathy, this reinforces the perceived relationship. This notion has been extended to consensual sadomasochism despite the fact that BDSM shares very little in common with sadism of a criminal nature. There is scant research that examines such a relationship; however, the assumption persists despite many within the BDSM community indicating that is simply not how sadomasochism of a consensual nature is arranged. Further, the emotion disgust is said to modify behaviour, including that of sexual nature, and as a consequence those who engage in more atypical sexual practices have lower levels of disgust sensitivity. Similarly those who are psychopathic, might also have attenuated levels of disgust sensitivity not unlike other negative emotions they seem to have an attenuated experience of. It is therefore necessary to explore the perceived relationship between these constructs to determine if there is, as suggested a relationship between psychopathy, BDSM and

attenuated disgust sensitivity. There are two research hypotheses under consideration for this study.

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3.4 Study IV (Chapter 7)

Study 4 examines the relationship between atypical fantasy with a focus on BDSM fantasy, disgust sensitivity, and psychopathic traits. Sexual fantasy is not necessarily an arbiter of behaviour, however, some research suggests that there is a relationship between atypical sexual fantasy, in particular, BDSM fantasy, and psychopathy. As disgust sensitivity is believed to be a moderator of sexual interest and behaviour, it is being included to determine if disgust sensitivity and/or psychopathy are related to atypical sexual fantasy in individuals that do not identify themselves as involved in BDSM.

While BDSM fantasy and behaviour may not be directly related; that is, there may be many who engage in BDSM fantasy but never the actual behaviour, there will be a cross comparison between groups that explores psychopathy and disgust sensitivity and the types of interests, at least shared by both groups.

3.5 Methodologies

3.5.1 Internet-based research

For some of the data collection online 'survey' style websites were implemented to facilitate data collection for the self-report measures. The studies in Chapter 6 and 7 were conducted online using Questionpro.com, an internet based survey hosting

website for the purposes of conducting this research. This was done in an effort to obtain as diverse a sample as possible to ensure that the results could be generalised more widely than is often the case with this type of research. Frequently psychopathy research that focuses on subclinical samples relies heavily on University students (Lilienfeld and Widows 2005) and, rather than use the same types of sampling strategy throughout it would be useful to obtain a sample that better reflected the general population, when possible. Special considerations were given to the BPS guidelines to ensure that protocols were put in place to avoid anyone under age 18 or other vulnerable populations participating in this research. This included restricting where the links were displayed, i.e. websites for individuals aged 18 and older, as well as age being provided before participants could proceed to the research. Password protection was also used to restrict access in an effort to ensure participants were within the age range they stipulated.

Also, as the PPI-R is copy-written, special permissions were obtained via PAR, Inc. who provides the PPI-R. This meant that the PPI-R questions could be administered online; however, it restricted access to one question at a time and required the use of password protection, as well to prevent individuals from illegally copying and using the questions elsewhere.

3.5.2 Sampling strategies

For the purposes studies II, III, IV, participants had been asked to self-select themselves based on the specific exclusion criteria for each study. More detail of these criteria is provided in the appropriate chapters. For Studies II and IV, convenience samples were employed along with the self-exclusion process. Study three snowball sampling along with the self-exclusion process proved necessary as the BDSM community can be quite insular and unwilling to participate in research. This required gaining trust and acceptance on the part of a key member within the BDSM community. Once assured

that this research was intended to explore BDSM objectively access was granted to the community. Also, self-identified members of the BDSM community were used exclusively in Study 3. There is no criteria/system/assessment for determining who is or is not active in the BDSM community (Nordling et al. 2006) and BDSM is not a disorder so it is necessary to rely upon individual's self-identification with this particular group for research purposes. This is consistent with other research conducted with the BDSM community (Nordling et al. 2006).

3.5.3 Exclusion criteria

Participants were asked to self-select themselves for participation in the research. This included a set of exclusion criteria that was either applicable to all studies, or specific to the particularly research paradigm under investigation.

As study II explores participants responses to emotionally valenced words via typed text on a screen, self-selection /exclusion criteria was set for participants with Dyslexia or other reading related learning difficulties so as not to skew the results as according to Price,(2011), reading ability is often not controlled for in Stroop studies, and this can create a confounding variable. Also, as those with English was a second language would process the stimuli slightly differently than those with English as a first language, individuals with English as a second language have been excluded from participation (Price 2011).

To ensure that participants who may have been victims of sex crimes previously are not re-traumatised by partaking in research that examines atypical sexuality including rape fantasies, participants had been asked to exclude them from participating in studies III or IV if they had been a victim of a sex crime.

3.5.4 Self-report assessments

Self-report assessments were used throughout the research While this can result in inflated correlations between data sets (Field, 2013) affect and sexual fantasy are internal processes that cannot be measured directly therefore require self-report. Further, the only prescribed method for assessing psychopathic traits in non –offenders is the use of self-report (Ray, et al. 2012) consequently, these studies required the use of self-report measures.

All the assessments measured these constructs using a Likert scale. In research, Likert scales are typically treated as ordinal level data, however, when Likert scales are summed for the purposes of obtaining an overall score and sub scores, the data may be treated as a latent variable known as a plastic interval (Gavin, 2008) and may be treated as interval data. For the purposes of this research all data obtained via these questionnaires that has been analysed statistically has been treated as a plastic interval for this reason.

3.6 Details of the self-report measures used

3.6.1 The PPI-R (Studies I-IV)

The PPI-R is a self-report measure of psychopathy that is intended for use with clinical, forensic, and subclinical samples, The PPI-R measure psychopathy across 8 domains including Machiavellian Egocentrism (manipulation, lying, taking advantage of others), Rebellious Nonconformity (unconventional, anti-authority attitude, defiance of social norms), Blame Externalisation (blaming others for one's own faults/problems), Carefree Non-planfulness (indifference towards goals/actions/problems), Social Influence (superficial charm, influence of others), Fearlessness (lack of anxiety, risk taking behaviour), Stress Immunity (calmness when faced with anxiety provoking stimuli), Cold-heartedness (absence of guilt and empathy). The PPI-R also includes three sub-scales that measure socially desirable responding (Virtuous Responding),

malingering (Deviant Responding), and Inconsistent Responding (measures a tendency to respond to similar items inconsistently) (Llilienfeld and Widows, 2005). The assessment tools available, such as the PPI-R (Lilienfeld and Widows, 2005) do not provide clinical 'cut-off' score as the PCL-R does rather it is suggested that a score of 70 or greater may be suggestive of some underlying pathology and that further testing is required.

3.7 Factor Structure of the PPI-R

The PPI-R is an adaption of the PPI; a 187 item assessment intended to measures traits associated with psychopathy. The PPI was adapted to make it more accessible to a wider audience. The language, at times was too culturally specific to a North American culture and the reading level required reducing to a younger mental age of 8 to make it more accessible to clinical/forensic sample, as well as community samples. The PPI-R is intended as a measure of personality traits associated with psychopathy, the emphasis is far less on the antisocial behaviours associated with the disorder. Again, this is to make it more appropriate for use with a variety of samples including, but not limited to offender/clinical samples, as the PCL-R does.

Preliminary factor analysis conducted suggested a two factor structure, PPI-I that has been called Fearless Dominance and PPI-II, Impulsive Antisociality (Benning et al. 2003). According to Patrick et al. (2006) these factors are statistically independent of each other and reflective of the psychopathy construct with PPI-I measuring affective and interpersonal elements of psychopathy and PPI-II measuring the antisocial behaviour and impulsivity along with "aggressive personality traits." (p. 2). More specifically, Fearless Dominance consists of the following PPI-R scales: Social Potency, Stress Immunity and Fearlessness scales, and Impulsive Antisociality is measured by the Machiavellian Egocentricity, Impulsive Nonconformity, Blame Externalisation and Carefree Non Planfulness scales. The Cold-heartedness Scale does not load well on to

either factor, and is therefore independent from both. The PPI-R is said to measure psychopathic traits across three factors: Self-Centred Impulsivity (Machiavellian Egocentrism, Rebellious Non-Conformity, Blame Externalisation, Carefree Non-planfulness), Fearless Dominance (Social Influence, Fearlessness and Stress Immunity), and Cold-heartedness, which currently does not load onto other factors identified but would typically be associated with Factor 1 of psychopathy. Additionally, these factors are said to correlate well with the two-factor structure of psychopathic traits most often identified in the literature, with Fearless Dominance and, which does not load onto either factor, but I soften associated with Cold-heartedness identified with Factor 1 or primary psychopathy and Self-centred Impulsivity identified with Factor 2 or secondary psychopathy (Llilienfeld and Widows 2005).The two factor structure of the PPI and subsequent PPI-R are consistent with the two factor model of psychopathy proposed (see chapter), with PCL-R Factor 1 sharing some features with PPI-I and PCL-R 2 Factor 2 fairly consistent with PPI-II.

3.7.1 Disgust Sensitivity Scale-Revised (Studies II-IV)

Disgust Scale –Revised (Haidt, McCauley and Rozin, 2007) 25 item self-report assessment of three cross-culturally identified dimensions of disgust including core disgust, animal reminder disgust and contamination. It is intended to measure individual's reports of disgust sensitivity across these domains.

3.7.2 Sexual Activity Checklist (Studies III and IV)

Sexual Activity Checklist Nordling (2007) Consists of a selection of sexual activities that Nordling developed with the BDSM community in mind to evaluate the activities the community members might engage in. Participants will indicate which activities they engage in and an overall score will be calculated based on the number of items participants participate in. This is an admittedly crude method of measuring BDSM,

however, there is no formal assessment of BDSM activity and Nordling has reported success in using this tool to measure differences in various groups so it will be included in this study. Activities range from the fairly typical, such as oral sex, through to atypical activities such as the use of weights, mummification on, gags, and scat.

3.7.3 Special scoring protocols for the PPI-R and Sexual Activities Checklist

3.7.3.1 PPI-R Scoring

The PPI-R is a psychometric tool requiring a good understanding of the factorial nature of psychopathy to be successfully utilised. Participants receives scores for each subscale of psychopathic traits measured including raw scores for each domain under evaluation as well as scoring for Virtuous, Devious and Inconsistent responding. Lilienfeld and Widows (2005) suggest that the exclusion criteria for potential participants consist of evaluation and removal of data that has a high rate of inconsistent responding. Those that score high on the Deviant and Virtuous responding scales should not be removed however because deviations in this scores are not necessarily indicative of intentional lying but may also be the consequence of negative or positive impression management. This is something that must be considered when evaluating research findings but should not dissuade researchers from utilising these tools. Included with the manual is a set of normative data for a various samples arranged by sex, age group, and whether or not the group was part of a community or forensic sample. While it would not be appropriate to outline instructions for how to score the PPI-R as it is a copy written test that requires purchase (see the manual for precise details) it is necessary to explain why participants scores have been divided into through groups of Low (>45-59), Moderate (60-69) and High (70+) for statistically analyses. Lilienfeld and Widows (2005) have indicated that the statistically mean score of the PPI-R is 50 and while there is no cut off to indicate that

indicates psychopathy a score of 70 or greater is considered clinically significant. Therefore, scores up to and including 59 which are within one standard deviation of the mean are listed as 'Low', scores from 60-69, which are above one standard deviation of the mean are listed as 'Moderate' and scores two standard deviations above the mean are listed as 'High'. This division of scores, while admittedly crude, enables an examination of the diversity within the construct of psychopathy to be explored with greater precision than if those that scored above 70 were listed as 'High' with anything below 69 listed as 'Low'.

In addition, the PPI-R factors, Fearless Dominance (PPI-R 1) and Impulsive Antisociality (PPI-R 2) were explored independently as (Benning et al. 2005) suggests that global scores may not provide adequate information regarding the two-factors and how they correspond to specific traits and correlates associated with psychopathy, because these factors do not correlate strongly with each other. For example, low anxiousness is a key feature associated with those who score higher on Fearless Dominance (PPI-R1) compared with those who tend to report higher levels of neuroticism and anxiety which is positively correlated with Impulsive Antisociality (PPI-R2) (Patrick et al. 2006).

3.7.3.2 Scoring for the Sexual Activity Checklist

The Sexual Activity Checklist has been developed by Nordling (2003/2006) as a measure of the diverse BDSM sexual practices that individuals may participate in. Currently there are no formal tools that measure the extent of someone's BDSM activity and because BDSM practitioners are so diverse an all-purpose tool such as this, which has been used in previous research, has been co-opted for the purposes of measuring the extent of the BDSM activities engages in. There is no value judgment implied or suggested by certain activities, rather, the number of activities an individual engages in is simply added up to provide a score of sorts. The more activities engaged

in, the higher the score. Scores run from 0- 41 as there are a total of 41 items on the checklist.

For the purpose of examining the extent of BDSM fantasy endorsement, the Sexual Activity Checklist was adapted to include a range or responses on a Likert scale that included Never (0), Seldom (.15), Occasionally (.25), Sometimes (.50), Often (.75), Regularly (1) . Scores may range from 0-41. This is admittedly a crude measure of BDSM fantasy, however, the Sexual Activities Checklist has been used in research to demonstrate differences within the community effectively and has been devised by experts within the field of BDSM, measuring the presence or absence of practices common to BDSM therefore it would be most beneficial to use with regards to BDSM fantasy, as well.

Chapter 4. A Systematic Review of the Psychopathic Personality Inventory (PPI), Revised(PPI-R) and Short Form (PPI-SF)

Confined to forensic and/or clinical settings psychopaths are more readily identifiable. Their behaviour is regularly monitored, their criminal and clinical histories recorded and routinely assessed. They essentially make their presence difficult to ignore by behaving in ways that are socially unacceptable (Hare 2010), failing to learn from their experiences and attempts to manipulate the forensic/clinical units they are incarcerated in (Coid and Ulrich 2010). Conversely, identifying individuals that may have a preponderance of psychopathic traits including sub clinical psychopaths, who function well in society, for research purposes, is considerably more difficult. Further, assessing the degree and severity they exhibit psychopathic traits has, historically, been less straight forward (Lilienfeld and Widows 2005).In the last two decades several self-report assessments specifically designed to measure psychopathic traits in both clinical

and sub clinical samples had been devised (Lilienfeld and Widows 2005). The Cleckley/Hare model of psychopathy is the basis for their design (Lilienfeld, et al. 2012). One assessment, in particular, had been touted as the 'gold standard' for measuring psychopathic traits in non-offending samples, the Psychopathic Personality Inventory Revised (Miller and Lynam 2012). A systematic review of the extant literature on the validation and reliability testing of the, PPI, PPI-R and the PPI-SF, both of which have been derived from the PPI are examined as currently the PPI-R is used most often recommend for use in research (Miller and Lynam 2012), to determine the validity, reliability and suitable each has for research purposes.

4.1 The use of self-report for examining psychopathic traits

Most experts bristle at the notion of using self-report to assess psychopathy with criminal and/or forensic samples (Hare 1993; Blackburn 2009). The reason for this, largely, stems from the concern that psychopathic individuals will be able to effectively mask their psychopathic traits, thus providing misleading and inaccurate responses to the assessment, essentially responding in a socially desirable way (McNeil 2006). This is frequently known as a 'faking good' (McNeil 2006). According to Hare, developer and proponent of the PCL-R, his clinical experience demonstrated the psychopath's capacity to 'fake good' or 'fake ill', if need be, after obtaining a copy of the manual for the MMPI, another tool used to assess personality, including personality disorder. This combined with the psychopath's ability to charm and manipulate makes diagnosis particularly difficult using self-report methods (Ray et al. 2013). Hare (1993) cautions that lay people are not the only ones who need to be concerned with being conned and manipulated by the psychopath. Clinicians and other experts need to be wary, as they too can be fooled. Because of this, the PCL-R and other tools devised for use with clinical/offending samples often preclude the use of self-report (Ray et al. 2013).

Instead, a combination of interview and examination of collateral data including case files, criminal history, etc. are employed to determine if an individual meets the criteria for a diagnosis of psychopathy (Hare 2003). In 2013 Ray and Rivera-Hudson published a meta-analysis examining the validity and reliability of sub-scales used to detect faking good and malingering for the PPI and found that across published studies that individuals were not particularly adept at faking good or malingering and also that individuals who scored higher on the PPI were not more likely to attempt to do fake good or malinger, despite concerns outlined by Hare and others, Ray and Rivera-Hudson (2013) are cautiously optimistic that this is not a substantial issue or a threat to the validity of self-report measures, in particular the PPI and PPI-R.

There is a need for research that examines traits associated with psychopathy in non-offending or clinical samples as the emphasis, thus far, has been on male, offending, North American samples for research purposes (Mahmut, et al. 2007). Despite the emphasis on this target population there is growing evidence that suggests that psychopathy is a heterogeneous, dimensional construct (Lilienfeld, et al. 2012) that varies in manifestation from a possible personality type (Book and Quinsey, 2004) through to disorder(Lilienfeld, et al. 2012; Miller and Lynam, 2012). As a consequence, understanding how an offender may differ from a non-offender; what prototypical traits may be consistent across samples and how they might diverge is critical for understanding what psychopathy is. For example, high functioning psychopaths, also known as a successful psychopath tend to be far less physically aggressive than their non-successful and offender counterparts (Lilienfeld, et al. 2012). Those identified as secondary psychopaths may share more features in common with someone who has antisocial personality disorder than a primary psychopath as observed in offender populations (Coid and Ulrich, 2010). Non-offending samples may be quite diverse in their presentations of psychopathic traits with some being very manipulative and impulsive whilst others may not be particular manipulative but extremely impulsive

and callous and lacking in remorse for their actions. The research and theory consistently leads to a heterogeneous, dimensional construct rather than a homogenous taxon.

Recently, Skeem and Cooke (2010) have warned, the construct of psychopathy is becoming subsumed by research that explores the facets of psychopathy most closely associated with the offender. Traits such as instrumental violence and criminal versatility are more and more becoming part of the psychopathy construct that was not included as part of the original Cleckley/Hare model as prototypical traits of psychopathy. Skeem and Cooke (2010) warns that this is due to an over-emphasis of comparing the all measures of psychopathic traits with the PCL-R and as a consequence inadvertently suggesting that psychopathy is what the PCL-R measures, rather than that the PCL-R measures traits associated with a particular type of psychopath. Cooke pointed out that in some cases assessments were altered to make them more consistent with the PCL-R so that they would correlate more highly and thus appear to be more valid measures of psychopathy. In response to Cooke's critique, Hare (2010) acknowledged these issues as problematic; more specifically he conceded that the Cleckley/Hare model did not, nor should it include criminal versatility or violence as part of the prototypical traits of psychopathy. The solution to the problem seemingly includes revaluation and refinement of the nomological network and nets to better represent the heterogeneous and dimensional nature of psychopathy; this includes research with diverse samples, as well as updating assessments used to measure psychopathic traits.

Interestingly, a similar observation was made by Meehl (1990) regarding psychopathy and the use of the MMPI. He noted that criminality and delinquency were not essential features of psychopathy, and that in some settings, these features may be over represented, therefore examining the traits in other samples is not only useful, but

beneficial and necessary as it provides evidence based information about the construct of psychopathy across different samples. Meehl argued that the traits associated with psychopathy were not confined to clinical and/or criminal samples and that certain features are not consistent with the original Cleckley/Hare model but hold true for some samples and not others. Unfortunately, his concerns and warnings were not heeded, and as consequence, the current conceptualisation of psychopathy is seemingly become biased. Similarly, though less substantial, research conducted with non-offending samples provides evidence that psychopathic traits are not uncommon in a variety of non-offending samples from university students (Lilienfeld and Widows 2005) through to community samples (Lilienfeld and Widows 2005). Overemphasis of one research sample has consequently lead to presumptions about the group as a whole, and now it would seem, psychopathy is becoming more synonymous with criminality despite the fact that it is not a prototypical trait of psychopathy (Meehley 1990; Skeem and Cooke,2010). According to Vidal et al. (2010) the PPI-R may actually measure psychopathic traits that are more consistent with the Cleckley model, than even the PCL-R, as a consequence. According to Patrick et al. (2009) the debate over the conceptualisation or conceptualisations regarding what psychopathy is predates the term psychopathy. Early theoretical discussion of the construct of psychopathy varied from one that shared features with the secondary psychopathy as identified by Pritchard (1835), another that more closely resembles the primary psychopath described by Kraepelin (1904) and a third conceptualization that suggested sadism, and brutality that is also often associated with criminal psychopathy.

While the majority of research conducted has focused on offending psychopaths, there have been efforts made to develop research tools for assessment of non-offending psychopaths and those with psychopathic traits who would not be considered disordered for research purposes (Lilienfeld and Widows 2005). These assessments have also been developed to aide in the diagnostic procedure but not to replace it

(Lilienfeld and Widows 2005). While they do not provide formal diagnoses of disorder, they may provide information on whether or not someone may have 'clinically significant' results that may require further examination if used in a clinical or forensic setting (Lilienfeld and Widows 2005).

Whilst there is burgeoning research that suggests self-report assessments of normal personality may also be used to identify those that demonstrate a host of psychopathic traits, this research is in the preliminary phases (Miller et al. 2010), and there are currently no formal parameters for identifying someone as more inclined towards psychopathic traits as opposed to some of the other personality disorders limiting their utility (Miller et al. 2010). For example, individuals who may exhibit traits associated with NPD may score quite similarly to those with traits associated with psychopathy on an assessment of normal personality making it difficult to disentangle if the individual is more inclined towards NPD traits or psychopathic traits (Miller et al. 2010). The reason for this is the comorbidity of certain personality traits being particularly high across both groups (Blackburn 2009). Most often, standard personality assessments are used in conjunction with assessments of psychopathic traits, rather than to the exclusion which makes them less than ideal for research purposes as participants may become fatigued, bored, or drop out of research where they are expected to complete several assessments concurrently (Field 2013). Therefore a decision was made to do a preliminary evaluation of existing literature and rely on expert recommendation as to which assessment should be used to evaluate psychopathic traits in non-offender/non-clinical samples. Most often, the PPI-R was recommended (Miller and Lynam 2012), frequently listed as the 'gold standard' of self-report psychopathy measures. This was followed by recommendations for the PPI, PPI-SF as well as other assessments including SRP III, however, the SRP III has been criticised by Skeem and Cooke (2010) for being altered to make it more similar to the PCL-R rather than adhering to the nomological network, the Cleckley/Hare model The

LSRP has been heavily criticized has not having a two-factor structure, but rather its two factors seemingly focus on Antisociality associated with psychopathy suggesting it measures traits associated with secondary but not primary psychopathy exclusively (Ross et al. 2007; Seibert et al. 2011). Consequently it is considered a less reliable and valid measure of psychopathic traits (Seibert et al. 2011).

4.2 Psychopathic Personality Inventory, PPI Revised and PPI Short Form

4.2.1 PPI-R

The PPI-R derived from the PPI. It is a self-report measure of psychopathic traits that is intended for use with clinical, forensic, and subclinical samples. The PPI-R measure psychopathic traits across 8 domains including Machiavellian Egocentrism (manipulation, lying, taking advantage of others), Rebellious Nonconformity (unconventional, anti-authority attitude, defiance of social norms), Blame Externalisation (blaming others for one's own faults/problems), Carefree Non-plan-fullness (indifference towards goals/actions/problems), Social Influence (superficial charm, influence of others), Fearlessness (lack of anxiety, risk taking behaviour), Stress Immunity (calmness when faced with anxiety provoking stimuli), Cold-heartedness (absence of guilt and empathy). The PPI-R also includes three sub-scales that measure socially desirable responding (Virtuous Responding), malingering (Deviant Responding), and Inconsistent Responding (measures a tendency to respond to similar items inconsistently) (Lilienfeld and Widows 2005). The assessment tools available, such as the PPI-R (Lilienfeld and Widows 2005) do not provide clinical 'cut-off' score as the PCL-R does rather it is suggested that a score of 70 or greater may be suggestive of some underlying pathology and that further testing is required.

The PPI-R was developed to make it more accessible to a wider audience (Lilienfeld and Widows 2005). The language, at times was too culturally specific to a North American culture and the reading level was reduced to a younger mental age of 8 to make it more accessible to clinical/forensic sample, as well as community samples. Additionally, virtuous and deviant responding subscales were included to assess socially desirable responding, as well as malingering. The PPI-R is intended as a measure of personality traits associated with psychopathy, the emphasis is far less on the antisocial behaviours associated with the disorder. Again, this is to make it more appropriate for use with a variety of samples including, but not limited to offender/clinical samples, as the PCL-R does.

4.2.2 PPI

Psychopathic Personality Inventory (PPI; Lilienfeld and Andrews 1996) is the original 187-item self-report measure of psychopathic personality traits originally intended for use with non-forensic/clinical samples.

The PPI has eight subscales: Machiavellian Egocentricity, Social Potency

Cold-heartedness, Carefree Non-planfulness, Fearlessness, Blame Externalization, Impulsive, Non-conformity, Stress Immunity Factor analysis of the PPI subscales yields two factors. Fearless-Dominance (PPI-I-score) includes the Stress Immunity, Social Potency, and Fearlessness subscales. Antisocial-Impulsivity factor (PPI-II) consists of Impulsive Non-conformity, Blame Externalization, Machiavellian Egocentricity,

and Carefree Non-planfulness subscales (Benning et al., 2003).

4.2.3 PPI-SF

The PPI-SF is an abbreviated version of the original PPI assessment; it includes 56 items intended to measure key psychopathic traits in non-offending samples. The subscales are identical to that of the PPI: Machiavellian Egocentricity, Social, Cold-heartedness, Carefree Non-planfulness, Fearlessness, Blame Externalization, Impulsive

Nonconformity, and Stress Immunity (PPI; Lilienfeld and Andrews 1996). The items selected for inclusion in the PPI-SF were those items that evidenced the highest loading for each of the psychopathic trait subscales of the PPI (Lilienfeld 1990).

A word of caution regarding the PPI and its derivatives for measuring psychopathic traits; Benning et al. (2005) suggested that the global score offered by the PPI may mask some factors of psychopathy that exploring the two factors independently did not. For example, the relationship between global score and criterion variables were less than if the two factors were explored independently when exploring relationships between psychopathic traits and other factors such as alcohol abuse, false heroism, and maladjustment, for example. As a consequence, they recommend that the assessment is valid, but that global score may not accurately reflect underlying correlations between psychopathic traits and other factors unless the two factors are explored statistically, independent of each other. This was similarly echoed in research conducted by Smith et al. (2013) suggesting that when conducting research, particularly when exploring external correlates of psychopathy, such as delinquency, antisocial behaviour, alcohol abuse, emotional deficits, and so on, reliance on the global score, may result in Type 2 errors in research and that at the very least, the two factors, along with Cold-heartedness should be explored independently. The reason for this is largely down to the heterogeneity of the traits as measured by the PPI and derivatives(Smith, et al. 2013).

4.3 Determining validity: Nomological network of psychopathy and psychopathic traits measured via PPI, PPI-R and PPI-SF

Measuring validity as originally proposed by Cronbach and Meehl (1955) cited by Benning et al. (2005) is the development and testing of a nomological network. A nomological network according to Lilienfeld et al. (2012, pp. 330) "an interlocking

system of predictions linking constructs to external correlates (as well as constructs to other constructs, and correlates to other correlates)." and is the development of a theoretical framework based on observation the Cleckley/Hare model (Cooke and Skeem, 2010; Lilienfeld, et al., 2012). and the empirical method(s) of measuring such Cronbach and Meehl, 1955 (for example, the PCL-R, PPI-R and other tools used to measure psychopathic traits), The theoretical construct is explored in relation to how it is measured to determine its construct validity. The theoretical construct of psychopathy is derived from the Cleckley/Hare model of psychopathy (Skeem and Cooke 2010: Lilienfeld et al. 2012) (see Introduction, p.) which were based on the observations of Cleckley and later confirmation was provided by empirical study of psychopathy by Hare and further elaborated upon by researchers such as Lilienfeld (1996, 2005), Levenson (2003), and others. Benning, et al. (2005) explain that the first step toward construct validity is to explore the correlations between measures of psychopathy, next the relationship between measures of psychopathy and measures of other personality disorders and finally the relationship between psychopathy measures and measures of normal personality can be used to provide evidence for construct validity. Miller and Lynam (2012) citing both Benning (2003) and Poythress et al. (2010) indicated that the bulk of the research that examined the validity measures used to explore psychopathy including the PPI and derivatives, thus far, focused upon the nomological network that has been generated by work done with the PCL-R and therefore constructed their meta-analysis around these same network and suggested that this is justified as the majority of psychopathy research has focused substantially on the forensic/clinical samples of interest within the field of psychopathy based research. He went on to acknowledge that there are other theoretically relevant elements of psychopathy that need be explored, however, he emphasized the point that has been echoed by both Mahmut et al. (2007) and later by Skeem and Cooke (2010) the majority of the literature focuses upon the offender, and consequently the PCL-R and

this has had an impact on psychopathy research thus impacting the course of the meta analysis he completed.

As the majority of the literature currently has such a tremendous emphasis on establishing the relationship between other measures of psychopathic traits with that of the PCL-R, this has resulted in a bias away from the original 'Cleckley/Hare' model of psychopathy and toward one that emphasises external behaviours more consistent with the offending psychopath(Miller and Lynam (2012), This is not an advantage, but rather to the detriment of psychopathy based research, particularly when there is a need for exploration of the diversity within the psychopathy construct (Mahmut et al. 2007) and this is precisely what the earlier work of Meehl (1990) and the more recent work of Skeem and Cooke (2010) have argued against. The conclusion being, the data available is biased and whilst it captures some of the essential features of psychopathy well, it is skewed towards a particular sub-type of psychopath. Regardless of the outcome of exploring the PPI and its derivatives, research that examines the validity and reliability of this construct needs to examine the construct of psychopathy across the spectrum of the disorder, not just the offender sub-type if a better understanding of psychopathy, including establishing a more inclusive nomological network is to be achieved. It is with bias in mind that the PPI and derivatives have been evaluated.

4.4 Assessing validity and reliability of self-report assessments

Statistical analyses are undertaken to determine the validity and reliability of a particular assessment. Research that examines the latent variable structure of psychopathy as measured by various assessment tools usually consists of exploratory and confirmatory factor analyses (Field 2013). Exploratory, as the name implies examines how items on a scale correlate with one another to form underlying factors associated with a measure. In the case of psychopathic trait scales, particular items will

correlate, forming a structure of positive associations between variables, resulting in a factor. Confirmatory differs in that a specific hypothesis or hypotheses regarding the underlying factor structure is being tested (Field 2013). So rather than statistically exploring the latent structure of variables, the use of Confirmatory analyses is meant to determine if an underlying assumption regarding a particular factor structure that is hypothesised to exist and is being tested for, though there are exploratory features of Confirmatory analyses (Field 2013). There are controversies surrounding the use of these analyses, particularly Confirmatory factor analysis. Confirmatory factor analysis is often considered too 'strict' a statistical measure of personality inventories (Vidal et al. 2010) and it need be pointed out that that factor analysis, while an important component of assessing validity, it is but one component, and is not considered as crucial as assessing discriminate and convergent validity with other measures of a construct, according to Lovenger (1957) and Skinner (1981) as cited by Vidal, et al. (2010).

Construct validity consists of several types of validity testing to determine how well an assessment or tool is measuring the construct under investigation. According to Trochim (2006) this covers several domains: Face validity- a basic measure of whether or not a construct appears to be measuring what it is meant to be measuring. Essentially, an expert would examine the content and determine if it is measuring psychopathy, at 'face value'.

Content validity-exploration of an assessment's operalisation against the specific content relevant to a construct. Comparing an assessment to the Cleckley/Hare model of psychopathy would be a gauge of way the way psychopathic traits have been operationalized is consistent with the existing construct that generally agreed upon by most experts.

Criterion Validity which consists of.

Predictive validity- 'the constructs ability to predict something it should theoretically be able to predict.' For example, a measure of psychopathic traits should enable a research to make predictions about respondent's lack of empathy or other traits prototypically associated with psychopathy.

Concurrent validity-'the ability to distinguish between groups that theoretically it should be able possible to distinguish between.' For example, the ability for an assessment to distinguish between someone who may be psychopathic as opposed to having schizotypal personality disorder.

Convergent validity-the convergence or correlation between the assessments with other assessments known to measure the same construct. For example, how well the PPI-R correlates with the PCL-R or other measures of psychopathic traits.

Discriminant validity-the degree the construct or assessment diverges from constructs it should not be theoretically similar to. For example, the expectation that an assessment of psychopathy would have low correlations with an assessment of positive personality traits, such as altruism and selflessness.

Reliability or consistency of a measure is usually conducted via test re-test. This is where an assessment is tested on a sample over time, ideally longitudinally, to determine if the assessment's results are consistent for participants over time (Anastasi and Urbina, 1997)

4.5 Systematic review

According to Torgerson (2003) the systematic review is intended as a thorough, completely transparent review of all existing research to identify consistency (and anomalies) across large sets of empirical data. A systematic review is intended to reduce bias and enable critical appraisal by combining relevant research in a systematic way. Systematic reviews have been adopted from the medical research community

and have a fairly rigorous set of criteria to adhere to ensure a transparent, unbiased review of the literature.

Torgerson (2003, p. 7) outlines the objectives of a systematic review:

- "to address a specific, well focused, relevant question
- "to search for, locate and collate the results of the research in a systematic way"
- "to reduce bias at all stages of the review (publication and other forms of bias)"
- "to appraise the quality of the research in light of the research question"
- "to synthesize the results of the review in an explicit way"
- "to make the knowledge more accessible"
- "to identify gaps; to place new proposals in the context of existing knowledge;"
- "to propose a future research agenda: to make recommendations:
- "to present all stages of the review in the final report to enable critical appraisal and replication"

A systematic review are often synonymous with meta analyses however a systematic review need not include a meta-analysis (Torgerson 2003 citing Chalmers, 2002) and there may be reasons why meta-analysis is not appropriate for a systematic review. For example, if all available literature cannot be found (Torgerson 2003), if existing data is known to contain biases, and if data is not homogenous (Hemingway 2001), a systematic review should not include a met- analysis.

Another concern regarding meta-analyses is that of unpublished literature. Another concern is inability to obtain all appropriate research for inclusion due to unpublished data being unavailable. Torgerson (2003) points out that some journal editors refuse to publish articles that result in negative or non-significant results due to a perceived lack of 'interest' on the part of readers. However, publication of studies with small samples that do yield a significant result combined with failing to report other small studies that do not, can lead to misleading results for any potential meta analyses undertaken, as part of a systematic review, particularly if the significant result is a consequence of a Type 1 error (Torgerson 2003). The presumption being that research that fails to achieve a certain result is somehow 'inferior' or inaccurate, in some way. This, however, results in a bias. Similarly, failure to include all available published research

without explanation or justification, again, results in bias. These difficulties are not intended to suggest that systematic reviews or meta analyses should not be undertaken. However, it can be argued that many of the protocols outlined by the Cochran Review (2008) and Torgerson (2003) cannot be adhered to as they do not apply to psychological research. For example, for a study to be considered appropriately conducted primary empirical medical study to be included for review, it should be a double blind design. Double blind research in psychology would potentially violate research ethics (BPS 2006). This is but one example of how the medical and social sciences discipline differ in the empirical research protocols. Similarly, randomised control designs are considered the ideal for empirical research and most appropriate for inclusion in systematic reviews (Torgerson 2003) again, rarely is this sampling method employed in psychological research. Similarly sample size may be an issue, according to Torgerson (2003), however, psychology research often includes studies with small sample sizes, but this, consequently can alter the statistical power of a meta-analysis, resulting in bias, therefore is frowned upon. It would be impractical to spend substantial time exploring these differences, it is necessary to be cognisant of some of the key issues as it impacts the strategies employed for systematic reviews for psychological research. Consequently, recommendations outlined by the Cochrane Review(2008), Hemingway (2001) Torgerson (2003) and Gagnier, et al. (2012), have been considered and applied where possible, however, this has been combined with strategies employed in practice for systematic reviews of psychopathy related research such as Miller and Lynam (2012) who conducted similar research examining the construct validity of the PPI and derivatives.

One issue that should not be ignored when considering whether or not to conduct a systematic review whether or not the data that is being collected is homogenous. At least, if a systematic review is to include a meta-analysis. According to Torgerson (2003), there are numerous reasons for this the underpinnings of a particular intervention, assessment or treatment may be similar, if they are not identical the consequence of pooling them for the purposes of meta-analysis, will result in point estimates that will not apply to any of the studies. Further, pooling of data that is similar but not identical can result in result in false confidence intervals and effect sizes (Torgerson, 2003). A more substantial issue with pooling data for meta-analysis in the case of the PPI and derivatives is that of bias with the research. According to Skeem and Cooke (2010) and in their response Hare (2010) all acknowledge an over reliance on the PCL-R to validate other measures of psychopathic traits has resulted in systematic bias within psychopathy literature. Consequently, the construct of psychopathy is now closely associated with features not part of the original Cleckley/Hare model which is said to be the nomological model of psychopathy; specifically, criminality and violence. A meta-analysis, in this instance may not adequately address this bias in the literature, as well as a narrative empirical synthesis because so much of the research, to date, has relied upon the PCL-R for construct validity of other measures of psychopathic traits resulting in some of these measures actually being re structured to make them more consistent with the PCL-R. Further, so much of the research has relied on male offenders for research purposes (Mahmut et al. 2007) that there is an over-representation of traits associated with offending psychopaths being superimposed on the construct of psychopathy as a whole (Skeem and Cooke 2010). Consequently, a narrative empirical synthesis has been used in an effort to reduce some potential bias of data and also to mitigate potential issues regarding the substantial heterogeneity within the data.

4.6 Protocols for the systematic review of the PPI, PPI-R, and PPI-SF

A systematic review requires a series of protocols be developed for identifying the most appropriate research available to address specific research queries (Hemingway 2001: Torgerson 2003). This may include published research articles, unpublished materials, conference proceedings, book chapters, print articles, etc.

The protocol consists of several steps that commences with developing the research queries, followed by constructing and implementing research parameters for data searches, including identifying key words to use to complete searches, identifying appropriate target samples, including sample sizes, for inclusion, as well as identifying the appropriate research designs and analyses for inclusion. This is followed by conducting the extensive literature searches. Reading article abstracts; followed by reading relevant articles, eliminating data that is not appropriate for the study and collating the data that is. Data extraction is completed, appropriate analyses are undertaken and report is completed detail the procedures and findings. Additionally, in medical reviews, however, this may apply to a psychological review, a schedule is prepared for follow-searches, and additions may be made to the review at regular intervals. This is to ensure the systematic review remains relevant over time.

4.6.1 Types of analyses available

Systematic reviews are often accompanied by meta analyses of the data, though they are not an essential feature of a systematic review (Torgerson, 2003). The purpose of a meta-analysis is to synthesise and examine the findings from several studies statically to investigate "validity generalization" of the data in an unbiased way (Anastasi and Urbina, 1997, p 125).

To complete a meta-analysis effectively all sources of heterogeneity should be systematically and consequently statistically be accounted for, if possible. There are several possible sources of heterogeneity that need to be considered; some of which are easier to systematically account for statistically than others. According to Gagnier et al. (2012) there are three types of heterogeneity that need to be considered:

- Methodological heterogeneity
    - Essentially how the studies differ in design and implementation
- Clinical heterogeneity
    - Differences resulting from participant characteristics such as sex, age, presence of disorder/illness, comorbidities.

Statistical heterogeneity is the consequence of methodological and clinical heterogeneity (Gagnier et al. 2012). Statistical heterogeneity can alter the meta-analysis substantially resulting in inaccurate summary effects, flawed conclusions, and as a consequence of bias, the studies will not be measuring the same effects. Complex statistical analyses can be added to a meta-analysis or other subtypes of meta-analyses can be employed to mitigate some of these affects this may include subgroup analyses, and meta-regression (Gagnier et al. 2012). The difficulty in implementing these features, however, is that they require substantial statistical expertise to know when and how best to employ some of these analyses. Also, these recommendations generally apply to issues surrounding methodological heterogeneity; clinical heterogeneity is may be more challenging to address as there are not currently standardised procedures for addressing such (Gagnier et al. 2012).

There are numerous sources of heterogeneity when considering how to synthesise the studies of the PPI, PPI-R, and PPI-SF. An obvious issue is that of the assessments themselves. Frequently it has been assumed that since the PPI-R and PPI-SF are derived from the PPI, they are measuring the same thing, in the same way. Consequently, numerous studies have reported validity testing for PPI and apply to

PPI-SF() or suggest that if the PPI is valid and reliable so to must its derivatives be. It is imperative that researchers not assume these tools are interchangeable and that the changes made to the PPI-R and PPI-SF have not altered the assessment. This needs to be examined more thoroughly empirically, though there are some examples within the systematic review that explore such, more work needs to be done to either independently verify each tool's merits with the construct of psychopathy as well as their correlations with each other. Another substantial issue is whether it is best practice to combine different samples. Specifically is it appropriate to combine the results form studies that focus on clinical or forensic samples with results from studies with 'healthy' participants. Further, is it appropriate to compare those formally diagnosed as psychopathic with those who have demonstrated key traits associated with the disorder but would not meet the criteria for a formal diagnosis and as well as comorbidity with other disorders.

Because there is so much heterogeneity within the data, combining it statistically via meta-analysis seems less than ideal without substantial statistical expertise, particularly when there is no standard procedure for how best to synthesis data across different samples (Gagnier et al., 2012). Some go so far as to argue that researchers are not to combine statistical data that lacks homogeneity for the purposes of meta-analysis Hemingway (2001). Whilst this recommendation seems excessive as there are statistical tools available, particularly that can be applied to methodological heterogeneity, there is another issue to consider that does make combining the data via meta-analysis inappropriate, in this instance. The objective of a meta-analysis is to explore data in an unbiased way, statistically. After careful consideration of the heterogeneity within the data, and that the bulk of the research has focused on ensuring that all measures of psychopathic traits, including measures of normal

personality when used for the purposes of assessing psychopathic traits, as well as the PPI and derivative measures correlate with the PCL-R, conducting a meta-analysis does not seem appropriate based on the concerns raised by Skeem and Cooke (2010). That research and theory have not remained consistent with the nomological network originally proposed that is generally accepted, which is the Cleckley/Hare model. Finally, the heterogeneous nature of psychopathy itself poses a challenge. By combining the data statistically, the variations that may present across studies and not others may be lost or downplayed when perhaps they should not. Therefore, a narrative empirical synthesis has been conducted. This includes a summary table and tabulation of data along with a critical review of the existing literature and discussion of future areas of research.

To reduce the potential for further bias that often occurs in the course of a narrative empirical synthesis, this review has incorporated some of Miller and Lynam's (2012) protocols and the majority of research studies for inclusion to ensure that the study selection, and procedures for synthesising the data are as consistent as possible with the procedures for completing a meta-analysis of the data.

A narrative empirical synthesis, like a meta-analysis, is intended to combine sets of empirical data to establish validity (Hemingway, 2001). Where it diverts from the meta- analysis is that it does not include a complex statistical analysis of the data. Research is compared and contrasted by the researcher using a summary table of the studies, tabulations and concludes with a critical review. Like a meta-analysis it should include thorough and precise protocols for the literature searches, the selection process for the inclusion/exclusion should be to the same standard as that of a meta-analysis to reduce the chance of bias. Narrative empirical syntheses are less often used because they are believed to be more prone to researcher bias (Torgerson 2003) particularly when considering study inclusion, however, considering the existing bias in the

psychopathy literature toward the PCL-R derived nomological network, and that a meta-analysis of biased data would not be appropriate; the narrative empirical synthesis was selected. In an effort to overcome potential article selection/inclusion all of the studies included in Miller and Lynam's (2012) meta analyses were included in the narrative empirical synthesis providing they fit within the research protocols outlined. This resulted in two studies being excluded as the pre-dated the data included in this analysis as they were published before 2005 and the date parameters for this systematic review were data published between 2005 and August 2012.

4.7 File drawer effect

A key methodological issue when conducting a systematic review is the known as the 'file drawer effect' (Torgerson, 2003; Miller and Lynam, 2012). Data collection may yield results that are inconsistent with other research findings, are not statistically significant, or lack statistical power and therefore are not submitted for publication (Torgerson, 2003). This effect cannot be mitigated entirely. Traditionally, best efforts are made to contact researchers known in the field to inquire about unpublished manuscript but this does not often yield results, as was the case here.

4.8 Grey literature

Systematic reviews are meant to include all relevant information regarding a particular research topic. This should include conference presentations, news articles, research posters, and other types of data dissemination (Hemingway, 2001). Often times this information may not include enough relevant statistical information to make it appropriate for inclusion in a systematic review that will include a meta-analysis,

however, wherever possible this type of information is meant to be, at the very least, considered for inclusion whenever available. Methodology

4.8.1 A priori queries

A priori queries regarding the assessment tools have been developed to explore the validity and reliability of the two assessments for decision making purposes as to which more appropriate use in a research is setting. The main research query is: Does the PPI and its derivatives demonstrate construct validity? Are the PPI and derivatives reliable? Which version of the PPI is most suitable for research purposes?

4.8.2 Research parameters

Articles published in English between 2005, when the PPI-R was first published, through August 2012 will be reviewed and evaluated for appropriateness for inclusion in the systematic review. Empirical research including meta analyses, statistical analyses examining validity and reliability including comparisons to other self-report measures of psychopathy, measures of normal personality, external correlates of psychopathy, and the PCL-R are to be included. Additionally research that evaluates the factor structure of the PPI, PPI-R and PPI-R SF have also been included, to examine the underlying factor structures of the PPI, PPI-R and PPI-SF to see if they are consist with the underlying factor structure of other psychopathy measures, as well as the theoretical structures proposed in the literature. Additionally, literature that explored the factor structure and construct validity of these measures has also been examined. Research needed to conform to appropriate ethical and research guidelines including meeting minimum standards considered appropriate for psychological research as laid out by the BPS and/or APA. Research samples included students, community samples, forensic, youth and clinical samples to examine how well the construct of psychopathy has been measured to ensure a reasonable measure of consistency in varied samples.

All available published studies were included providing the study explored the Cleckley/Hare model of psychopathy as this is considered the basis for the nomological network of psychopathy (Cooke and Skeem, 2010; Lilienfeld, et al. 2012). Studies were excluded if they were exploring factors not currently associated with this model of psychopathy; whilst it is acknowledged that understanding of the construct of psychopathy is evolving and the core traits associated with psychopathy may change, at present it exploring the validity and reliability of the PPI and its derivatives should focus upon the agreed upon framework. Similarly, studies were excluded if it was unclear which version of the PPI was being assessed.

4.8.3 Keywords

Psychopathic Personality Inventory, Psychopathic Personality Inventory Revised, Psychopathic Personality Inventory Short-form, PPI, PPI-R, PPI-SF, psychopathic personality traits, validity, reliability, factor structure, self-report, psychopathy, personality disorder, Dark Triad, subclinical psychopathy, non-offender, community sample, psychopathic traits, Cleckley/Hare model, Cheater/Warrior Hawk Hypothesis, construct validity, discriminate validity, convergent validity, exploratory factor analysis, confirmatory factory analysis, meta-analysis, Psychopathy Checklist Revised, PCL-R, MPQ, Five Factor Model, FFM, Levenson Self Report Psychopathy Scale, LSRP, Self-report Psychopathy Scale III, SRP-III, self-report.

4.8.4 Academic search engines

Electronic searches for journals have been conducted using: Summon, Articles+, Science Direct, EBSCO, SAGE Publications, PsyINFO, PubMed, and Google Scholar have been used.

4.8.5 Data extraction

Preliminary searches yielded approximately 4,972 search results due to the inclusion of the word personality appearing in the text. However, after refining search results by

combing key words, the search results reduced substantially to 511 results. After culling duplicates articles, this was reduced to 376. This was eventually reduced to 68 studies that were considered for inclusion. All abstracts were reviewed for relevance and appropriate articles were either downloaded or procured from print library collections, depending on availability. If articles were not readily available, intra-library loans were requested. This did not constitute many articles, as two University library collections were utilised for the purposes of data collection.

Published articles that provided complete details of the methodology employed including research sample(s), assessment tools, procedure(s), complete results and discussion were included. If articles did not provide these details they were removed from the data set. The decision to focus on published literature was influenced by a similar protocol adhered to by Miller and Lynam (2012) for their meta-analysis.

Summary table generated included the following details extracted from the data: Author(s), year of publication, sample size and type, version of the PPI, and a result. This table was based on the summary table devised for Miller and Lynam's (2012) meta-analysis.

4.9 Narrative empirical synthesis

A total of 68 studies were included in the systematic review. Table provides details of the number of studies per PPI derivative as well as the average sample size. Student Samples represented 44% of the total sample size for the PPI and derivatives, followed by offender samples, with 26.5% of the sample. 50% of the studies explored multiple aspects of validity; most often concurrent, convergent and discriminant validity were combined with factor analysis of the PPI and derivatives. However some studies explored factor analysis, or external correlates, correlation studies across measures of personality disorder, normal personality independently.

Table 4-1 Tabulation of PPI and Derivatives

	PPI	PPI-R	PPI-SF
Number of Studies	25	28	14
Average Sample Size	366	204	471

The following summary table provides specific details of each study author, date the study was published, version of the PPI assessed, the sample type, sample size, and the outcomes of the study

Table 4-2 Summary Table of Systematic Review Studies

Author	Date	Sample Size	Sample Type	Version	Outcome
Aharoni, Amstrong, and Kiehl	2012	241	Mixed Offender /Community/Student	PPI	Results suggest that individuals with higher psychopathic traits and/or psychopathy did not demonstrate impaired moral decision making, contrary to earlier research and supposition about impaired moral decision making in psychopathic individuals
Anestis, Caron and Carbonell	2011	360	Student	PPI-R	As research suggests varying Factor structure for the PPI ranging from 1-4, the study explored the potential impact of gender. The authors tested, one, two and three factor structures, using biological sex to test for variance findings suggested that when sex was combined there was invariance across the three different factor structures, indicating none was a perfect fit and

					that sex differences in the measure of psychopathy may impact which traits, and therefore which factors are represented by sex.
Baskin-Sommers, Zeier, and Newman	2009	473	Offender	PPI-SF	Evidence of external validity between PCL-R and PPI-SF. Anomalous attentional control was exhibited in relation to Factor 2 but not Factor 1 of psychopathic traits, those that scored higher on Factor 1 exhibited superior attentional control
Benning, Patrick, Blonigen, Hicks, and Iacona	2005	1049	Community	PPI	MPQ and PPI demonstrated discriminant validity with socialization, fearfulness, and convergent validity with narcissism, and thrill seeking. Impulsivity, disinhibit ion, boredom, PPI interpersonal factors 1 correlated somewhat with PCL-R Factors 1 and PPI Factor 2 correlated preferentially to Factor 2 of the PCL-R
Benning, Patrick, Salekin, and Leistico	2005	326	Student	PPI	The study provided evidence of the two factor structure as measured by the PPI. Additionally, PPI-2 correlated with symptoms of Cluster B personality disorders, including Antisocial Personality Disorder, but unrelated to Narcissistic personality Disorder. PPI-1 was related to Dominance and low Neuroticism as measured by the FFM. Another point made was that the SRP-III and PPI seem to diverge on the versions of psychopathy or variants of psychopathy measured with the PPI measuring a well-adjusted variant and the SRP-III measuring a mal-adjusted variant of psychopathy.
Berardino, Meloy, Sherman, and Jacobs	2010	105	Offender	PPI	PPI correlated moderately (.56) with the PCL-R and MMPI, PPI demonstrated two factor structure similar to PCL-R to some extent, PPI correlated well with DSM-IV criteria for anti-social behaviours, but only provided weak evidence of discriminant validity.
Blonigen, Patrick, Douglas, Poythress, Skeem, Lilienfeld, Edens and Krueger	2010	1741	Offender	PPI	PPI and PCL Factor 1 are measuring related but non identical constructs, whereas PPI 2 and PCL Factor 2 seem to be measuring much the same Factor structure. PPI-1 was weakly correlated (>.4) with anti-social features, but PPI-2 was well correlated with aggression and antisocial symptoms (>.5) as well as DSM Personality Disorder symptoms as measured by SCID

Buckholtz, Treadway, Cowan, Woodward, Benning, Li, Ansari, Baldwin, Schwartzman, Shelby, Smith, Cole, Kessler, and Zald	2010	24	Community	PPI	Evidence of neurological differences in dopamine release and reward anticipation for individuals who scored higher on the PPI compared to those that did not. Suggests the PPI is measuring psychopathic traits associated with impulsivity, antisocial behaviour and substance abuse.
Cima and Raine	2009	121	Offenders	PPI	Both Reactive and Proactive aggression correlated moderately with PPI-2 Factor (.6) but weakly with PPI-1 (.13 and .26). Machiavellianism and Cold-heartedness and Impulsive non conformity were also moderately correlated with proactive aggression. Reactive aggression was had a negative moderate correlation with reactive aggression.
Copestake, Gray, Snowden	2011	52	Offender	PPI-R	PPI-R total correlated with the PCL-R (.54), PPI-I did not correlate strongly with any Factor structure of the PCL-R beyond Factor 2 (.21), PPI-R 2 correlated with PCL-R 1(.48), and PCL-R2 (.44). Additionally, PPI-R 2 correlated with the four facet model across all four facets ranging from (.39-.48). The explanation provided by the authors is that the tools have been developed with different samples in mind as well as different conceptualisations of psychopathy that are being measured. According to the authors, some features are better represented by the PPI-R, such as boldness as represented by Fearless Dominance, when compared with the PCL-R.
Del Gaizo and Falkenbach	2008	175	Student	PPI	PPI-1 demonstrated weak negative correlations with shame, fear, and distress. All PPI factors correlated negatively with negative emotion, but all correlations were below (.-4), PPI-2 had some weak positive correlations with negative emotion with the highest for hostility (.4) and the weaker correlations (>.3) for shame, fear, or distress
Denson, White and Warburton	2009	100	Student	PPI-R	Individuals with higher scores on the PPI-R demonstrated higher rates of trait displaced aggression than lower scoring peers. The study has some dubious elements, however, as participants were given alcohol in one condition and intentionally provoked in another to see if these conditions resulted in greater aggression in relation to PPI-R measured traits

					associated with psychopathy. Alcohol did not impact, however, the opportunity to ruminate on provocation did lead to greater displaced aggression.
Derefinko and Lynam	2006	346	Student	PPI	PPI, SRP, and NEO-PI-R were assessed for concurrent validity. The total scores correlated well across measures, however the factor structures were not consistent across measures. PPI-2 correlated strongly with negative traits associated with the NEO-PI-R including vulnerability, anger, hostility and depression consistent with findings of other studies that the PPI-2 taps into anti-social features. Scores for PPI-1 and SRP 1 were similar but correlations were divergent as they are said to tap into different elements of personality traits.
Edens, Poythress, Lilienfeld and Patrick	2008	46	Offender	PPI	Comparison of the predictive validity of the PPI and PCL-R with the PPI outperforming the PCL-R with higher correlates of predictive validity for institutional misconduct. Total and Factor scores were predictive of misconduct with Factor 1 predictive of non-aggressive misconduct (>.04) and Factor 2 associated with aggressive (>.03).
Edens, Lilienfeld, Poythress, Patrick and Test	2008	131	Offender	PPI	PPI-2 demonstrated criterion related validity for aggressive misconduct, non-aggressive misconduct and any other types of misconduct. PPI-1 was unrelated to these antisocial behaviours. Correlations were all fairly week (>.4) Machiavellian Egocentricity and Impulsive Non Conformity were the traits that correlated the most with these behaviours, both (>.4)
Edens and McDermott	2010	200	Psychiatric	PPI-R	Factor Analysis to test the two factor structure of the PPI-R was conducted; Factor loading demonstrated a two factor structure consistent with previous research with Machiavellian Egocentrism, Rebellious Non Conformity, Blame Externalisation and Carefree Non-planfulness loading on to PPI-R2 and Social Influence, Stress Immunity and Fearlessness loading on to PPI-R1.
Edens, Marcus and Vaughn	2011	723	DYS Residents	PPI-SF	Study explored whether psychopathy is a unique taxon or a heterogeneous, dimensional in a youth offender sample. Results support a dimensional construct; traits vary across youth samples as they do in adult samples,

					according to research. Evidence reported link between antisocial traits and PPI-SF2, in particular, as well as poor socialisation.
Eisenbarth, Alpers, Conzelmann, Jacob, Weyers, and Pauli	2008	69	Psychiatric plus Control	PPI-R	Consistent with previous research this study demonstrated correlations between ADHD symptoms and psychopathic traits with male participants showing a correlation of (.5) blame externalisation with inattention and hyperactivity, and female participants demonstrating a correlation (.6) between carefree non-planfulness and inattention and hyperactivity. Male participants also demonstrated significant correlations for Machiavellian egocentrism and ADHD symptom severity (.5).
Falkenbach, Poythress, Falki, and Manchak	2007	97	Student	PPI	When compared with the Levenson Psychopathy Scale for external correlates of psychopathic traits, aggression and anxiety, the PPI outperformed it demonstrating better convergent and discriminate validity. Further, the Levenson Psychopathy Scale seemed Factor 1 did not correlate with PPI-1, rather with Factor 2 and there is some suggestion that the LSP only measures traits associated with Factor 2 of psychopathy, not one, therefore making it a less reliable measure than the PPI according to the authors
Fowler and Lilienfeld	2007	65	Student	PPI-SF	Total PPI-SF correlated (.5) with Personality Diagnostic Questionnaire, APD scale, and Levenson Self Report Psychopathy Scale (.4), and did not correlate with negative emotion scale (.09)
Fulton, Marcus and Payne	2010	511	Student	PPI	PPI scores correlated with increased self-report of risky sexual behaviours. This is consistent with the Cleckley model of psychopathy that suggested individuals were more inclined towards indiscriminate sexuality. This was more highly correlated in males than females, was associated with PPI-2 with correlations of (.44) for both PPI-1 and PPI-2 with brief sensation seeking, and RSS and PPI-1 (.22) and PPI-2 (.27). These correlations are fairly weak, however.
Gaughen, Miller, Prior and Lynam	2009	217	Student	PPI-R	PPI-R Factor 1 did not correlate with LSRP 1, SRP 1; this is believed to be because the PPI-R 1 measures a more adaptive variant of psychopathic traits, original consistent with the Cleckley model of Psychopathy and not necessarily a failing of the PPI-R. When

					compared with normal measures of personality used to measure psychopathic traits, NEO PI-R and MPQ, the NEO PI-R is said to be a better measure of psychopathic personality traits than the MPQ and that in conjunction with the PPI-R or other psychopathy measures it performs even better. The NEO PI-R may even outperform the PPI-R in terms of assessing Factor 1 traits. A concern regarding this study, as pointed out by the authors, however, is that due to so many statistical analyses being conducted, there is a risk of Type 1 errors so the results should be viewed with caution.
Hopely and Brucnelle	2012	92	Offenders	PPI-R	Relationship between PPI-R total scores were correlated positively with disinhibit ion. PPI-R 1 was strongly linked to disinhibit ion and reduced anxiety and positively related to PPI-R 2. Total PPI-R scores were positively correlated with opioid, stimulant and hallucinogenic use, PPI-R 1 was more weakly associated with substance dependence than PPI-R 2 The study provided evidence for the two factor structure as measured by the PPI-R and that some personality traits are differentially associated with the two factors of psychopathic traits. The study consisted of several correlations and regressions, the authors suggest the results should be interpreted with caution as there is a risk of a Type 1 error as a consequence.
Howard, Balster, Cottler, Wu and Vaughn	2008	723	Youth	PPI-SF	Total PPI-SF, Fearlessness and Impulsive Non-Conformity scores had the largest effect sizes related to inhalant abuse and misuse. This involved participants who had inhalants/solvents, many of them lifelong, as well as experience head trauma which needs to be factored when considering results. Also, this study included several statistical analyses, so there is risk of a Type 1 error.
Justus and Finn	2007	99	Community	PPI-SF	PPI-SF scores negatively correlated with Fear (-.49), Harm Avoidance (-.75) and positively associated with Disinhibit ion (.46) and Boredom susceptibility (.70). PPI-SF total scores correlated with DSM-IV Antisociality scale (.61) and MMPI-Pd (.35). PPI-SF 1, negatively correlated with Anxiety (-.70), and Anxiety (-.41) whereas PPI-SF 2 positively correlated with Anxiety (.59) demonstrating differences between the two-factor structure consistent with findings that suggest

					that those that score higher on PPI-SF1 will experience greater stress immunity than those that score high on PPI-SF 2
Kastner, Selborn, and Lilienfeld	2012	880	Mixed Student/ Offender	PPI-SF	Validity of the PPI-SF was tested against the PPI to determine if their measuring similar constructs. PPI was more reliable a measure, particularly with offender sample. Several assessments were used to compare validity including several external correlates such as Empathy, Narcissism, Machiavellianism, as well as the MMPI and SRP-II. Consistently the PPI outperformed the PPI-SF across all measures, suggesting that the PPI-SF lacks the construct validity of the original measure and should be used with caution, particularly with offender samples. *
Kruh, Whittemore, Arnaut, Manley, Gage, and Gagliardi	2005	50	Psychiatric	PPI	PPI correlated moderately with the PCL-SV (.62) total scores. PCL-SV Factor 1 and PPI-1 (.45) and PCL-SV 2 and PPI-2 (.65) demonstrating that the underlying factor structures were also similar. PPI produced lower correlations for previous recorded offenses (.26-.04) than the PCL-SV based on official record, but was more strongly correlated with self-report of previous violence that may not have been officially recorded. There were reported discrepancies between the factor structure of the PPI and PCL-SV but the authors suggest that this may be due to the measures examining different traits associated with psychopathy. For example, the PPI measures anxiety and the PCL-SVdo not.
Lander, Lutz-Zois, Rye, and Goodnight	2012	104	Students	PPI-R	Anxiety was unrelated to PPI-R 1 and related to PPI-R factor 2, consistent with previous findings suggesting that the two factor structure represent variants of psychopathic traits that do not correlate with each other and may represent different variants of psychopathy known as primary and secondary psychopathy.

Lee and Salekin	2010	1229	Student	PPI-SF	Research suggested sex plays a pivotal role in the differences in how psychopathic traits manifest and that males and females varied on their presentation of psychopathic traits. Interestingly the results suggested that female's manifestation of psychopathic traits did not correlate with external correlates of psychopathy as measured in this study, whereas males were more typical. Antisocial behaviours, in particular, females were less likely to self-report engagement with, compared to males. This is another study that suggests that biological sex has an impact on the presentation and measurement of psychopathic traits in non-offenders.
Lilienfeld and Widows	2005	507	Mixed	PPI-R	The authors conducted several statistical analyses to confirm the construct validity of reliability (including test-retest reliability of the PPI-R with community and offender samples. The results provide evidence for a two-factor structure, demonstrate concurrent, convergent and discriminate validity of the PPI-R with measures of normal personality as well as assessments of psychopathic traits. However, the authors suggest that more research needed to be done, particularly to explore external correlates of psychopathic traits, such as neurocognitive and affective deficits associated with psychopathy.
Lynam, Gaughan, Miller, Miller, Mullins-Sweatt and Widgier	2011	909	Student	PPI-R	PPI-R total scores positively correlated with LSRP and SRP scales, as well as with measures of normal personality EPA and NEO-PI-R that may be used to assess psychopathic traits. Correlations were low to moderate ranging from (.23-.65).
Lynam, Gaughan, Miller, Miller, Mullins-Sweatt and Widgier	2011	77	Offender	PPI-R	Total PPI-R scores correlated well with NEO-PI-R scores (.72). Similarly overall scores correlated with those of the EPA (.83) suggestion that it is measuring a similar construct to those measured by assessments of normal personality that are sensitive enough to measure traits associated with psychopathy.
Malterer, Lilienfeld, Neumann, and Newman	2010	876	Offender	PPI	PPI as compared to the PCL-R PPI-2 correlated strongly with PCL-R factor and overall scores similarly correlated moderately, however, PPI-1 did not correlate with the PCL-R suggesting it is not measuring the same construct of psychopathy. The results for offenders were particularly less strongly correlated than previous research suggested.

Malterer, Lilienfeld, Neumann, and Newman	2010	247	Offender	PPI	PPI as compared to the PCL-R PPI-2 correlated strongly with PCL-R factor and overall scores similarly correlated moderately, however, PPI-1 did not correlate with the PCL-R suggesting it is not measuring the same construct of psychopathy. The results for offenders were particularly less strongly correlated than previous research suggested.
Malterer, Lilienfeld, Neumann, and Newman	2010	130	Student	PPI	PPI as compared to the PCL-R PPI-2 correlated moderately with PCL-R factor and overall scores similarly correlated moderately, however, PPI-1 did not correlate with the PCL-R suggesting it is not measuring the same construct of psychopathy.
Morgan, Gray, and Snowden	2011	80	Community	PPI-R	PPI-R total scores were very weakly correlated (>.3) with impulsivity related tasks suggesting a poor relationship between PPI-R and impulse control issues. This may be demonstrative of non-offenders being higher functioning and therefore less prone to impulse control issues, than offender counterparts.
Miller and Lynam	2012		Meta-analysis	PPI, PPI-R PPI-SF	49 studies were included and analysed to determine the validity and reliability of the PPI and derivatives, including 2 Factor structure exploration, external correlates, general personality traits and APD. The findings do not support the inclusion of PPI-1 as a measure of psychopathic traits according to the authors as these traits did not correlate with the PCL-R nomological net of psychopathy. Indicators are that when compared to the PCL-R nomological net, the PPI and its derivatives are measuring a similar but different conceptualisation of psychopathy. The PPI and derivatives showed good concurrent and divergent validity with other measures of psychopathic traits as well as external correlates. The studies included in the meta analysis were also included in this systematic review

Mullins-Nelson, Salekin, and Leisteco	2006	174	Student	PPI-SF	PPI-SF was negatively correlated with total (-.40), and emotional empathy. PPI-SF 2(-.39), perspective taking was also negatively correlated PPI-SF 2(-.28) this is consistent with research that suggests that PPI 2 may represent a maladaptive variant of psychopathic trait clusters, whereas PPI 1 is adaptive and highly functional. Similarly PPI-SF 2 correlated with a variety of antisocial measures from academic misconduct to violations of the law. This did not find substantial sex differences between males and females with regards to external correlates of psychopathy, both scored similarly, admittedly females correlations were smaller, and some non-significant, but were also in the direction expected of psychopathy based research.
Ostrov and Houston	2008	679	Student	PPI-SF	PPI-SF 1 was negative and null correlated with aggression, including proactive, reactive and impulsive aggression. PPI-SF 2 was positively correlated with proactive, reactive and impulsive aggression (.3-46). This is consistent with finding suggesting PPI-SF2 is more closely related to secondary psychopathy and features associated with APD than PPI-SF1
Patrick, Edens, Poythress, Lilienfeld and Benning	2006	96	Offender	PPI	Demonstrates convergent and discriminate validity of psychopathic traits, with a particular emphasis on the exploring the two factors associated with psychopathy independently. Relationship between PPI-1 and PPI-1I is very weak (.04) demonstrating they are measuring two distinct factors associated with psychopathy. PPI-1I correlated with aggression (.66) and (-.24), as well as correlating with features of BPD (.67). PPI-1 correlated with individual facets of the PAI including Dominance (.50), Anxiety (-.37), whereas PPI-1I positively correlated with aggression (.62), antisocial features (.71), Anxiety (.49) drug problems (.36) and other features associated with APD. Again demonstrating the two factor structure, as well as the case for Primary and Secondary psychopathy variants.
Patrick, Edens, Poythress, Lilienfeld and Benning	2006	89	Offender	PPI	Evidence of two factor structure as well as evidence of concurrent and discriminate validity with external correlates that were unique to the two factors in an offender sample. The external correlates of this study included various forms of institutional misconduct. Results for the PPI-2 provided evidence for moderate to strong correlations with antisocial behaviours including aggression,

					borderline personality features as well as drug and alcohol abuse. These external correlates did not correlate well with PPI-1, which correlated negatively with anxiety, somatic disorders, and suicidal ideation.
Poythress, Lilienfeld, Skeem, Douglas, Edens, Epstein, and Patrick	2010	1472	Offender /Drug Treatmen t	PPI	PPI and LSPS were compared with the PCL-R with the PPI outperforming the LSPS. PPI-1 and PCL-R 1 (.25) and PPI-1I and PCL--R (.39). The PPI, LSPS and PCL-R were also tested for 35 external correlates of psychopathic traits and again, the PPI outperform the LSPS. The authors are cautious about suggesting that the PCL-R and PPI are measuring the same version of psychopathy, however, just suggesting that of the two measures, the PPI is more consistent than the LSPS. Most of the correlations were weak to moderate.
Pryor, Miller, and Gaughan	2009	229	Student	PPI-R	Correlation between PPI-R and LSRP) were assessed. Total scores yielded a moderate correlation (.64), as did Factor 2 scores(.65), however, Factor 1 scores did not correlate strongly (.21) When compared with measures of normal, albeit negative personality traits measured by the SNAP, PPI-1I correlated with manipulativeness (.62), aggression (.47). impulsivity(.54). Again demonstrating the two factor structure measured by the PPI-R, as well as that there seem to be variants between primary and secondary psychopathic traits.
Ray, Poythress, Weir, and Rickelm	2009	92	Offender	PPI-R	PPI-R two factor structure demonstrates variation in impulsivity. Total scores between Impulsive behaviour scale and PPI-R correlate at (.67) with PPI-1I correlating with Urgency (.70), lack of premeditation (.44), lack of perseverance (.45). PPI-1 correlates strongly with sensation seeking (.68) but weakly through negatively with the other factors that are correlated with PPI-1I
Ray, Weir, Poythress, and Rickelm	2011	85	Offender	PPI-R	PPI-R was tested against the PPI as well as external correlates of Narcissism, aggression, emotional intelligence and negative emotion. PPI-R was remarkable similar to the PPI, Reliabilities (α) were nearly identical with the exception of Stress Immunity and Impulsive non-conformity which varied somewhat. PPI-R did not correlate as strongly with NPI as the PPI did, particularly with regard to PPI-R 1. PPI-R correlated more strongly for aggression with the AQ than the

					PPI did, both correlated similarly with the WLEIS scale. And there was some variance in scores with the PPI-R correlating more with the negative emotion scale than the PPI. These differences, according to authors are too negligible and to be expected, and according to authors these measures are seemingly equivalent to each other.
Riling, Glenn, Jairam, Pagnoni, Goldsmith, Elfenbein, and Lilienfeld	2007	30	Student	PPI	Prisoner's Dilemma game, and fMRI imaging were used, determined that those that scored higher on measures of psychopathic traits were less cooperative, more likely to defect, and had reduced paralimbic activity, when compared to those with low scorers. Provides evidence of the neurocognitive differences associated with psychopathy, as well as the more selfish and self-centred traits associated with the disorder.
Ross, Benning, and Adams	2007	293	Student/ Offender	PPI	PPI-1 did not correlate strongly with any of the features of executive dysfunction, PPI-1I, however correlated with apathy (.37), Disinhibit ion (.69), and executive control (.64). Similar findings for the LSRP-II were also found. The FFM Psychopathy correlated with Disinhibtion (.42). Suggesting all three are capturing elements of psychopathic traits and executive dysfunction, a common symptom of psychopathy.
Ross, Benning, Patrick, Thompson, and Thurston	2007	326	Student	PPI	PPI-1 correlated negatively with BIS (-.57), and somewhat with (.32), and FFM model of psychopathy prototype (.50)the PPI-1 did not correlate well with the LSRP Primary or Secondary psychopathy scales. PPI-1I correlated with LSRP Primary (.55) Secondary (.63) and Total score (.70), and BAS fun-seeking (.36),and FFM (.38). PPI-1 correlated with Neuroticism (-.53) and Extroversion (.43) and PPI-1I correlated withAgreeableness (.-48), Conscientiousness (-.53) and Neuroticism(.34)This demonstrates the consistency of the two factor model purportedly measured by the PPI, as well as its validity as it correlates with the FFM, as well as individual traits associated with psychopathy as measured by the BIS/BAS system. This also demonstrates issues with the LSRP, as there has been criticism suggesting it only measures secondary psychopathy.

Ross, Molto, Poy, Segarra, Pastor and Monanes	2007	326	Student	PPI-R	PPI-R 1 correlated with BIS (-.69) and BAS (.55), similar correlations were found for the SRP-III Factor 1 and APD Callous/Unemotionality. The LSRP 1 did not perform quite as well. PPI-R II did not correlated with BIS but did with BAS (.52) these findings were not consistent with the SRP-III Factor 2 which had a stronger negative correlation for BIS, but were very consistent with the APSD for measuring secondary psychopathy.
Ross, Benning, Patrick, Thompson and Thurston	2009	293	Mixed	PPI	Explored the two factor structure of the PPI including exploring the external correlates of the BAS/BIS inhibition system. Results supported the two factor structure associated with the PPI, as well as correlations between PPI-1 and low anxiety, high extroversion and openness, and PPI-2 was correlated with anti-social features including higher neuroticism, low agreeableness, and low conscientiousness. Further, both were differentially related to the BIS/BAS impulsivity as well as correlating well with NEO-PI-R
Sandler	2011	124	Student	PPI-R	Test of reliability for the PPI-R between the computerised and paper format with an average of 26 days delay between administrations. The paper and computerised version results were strikingly similar suggesting they are measuring the same construct in the same way, simply using varied formats. The test-retest reliabilities were high and significant suggesting consistency and equivalency of the measure, regardless of administration.
Schmeelk, Sylvers, and Lilienfeld	2008	220	Student	PPI-SF	Contrary to other studies, there were no gender differences with regards to relational aggression and scores on the PPI-SF. The relationship between relational aggression was significantly correlated with PPI-SF 2 relational aggression(.53) and overt aggression (.59), the authors express surprise by these findings but this would be consistent with other research that suggests a relationship between anti-social features are more closely associated with Factor 2 of the PPI and derivatives.

Seibert, Miller, Few, Zeichner and Lynam	2011	143	Student	PPI-R	Factor structure and validity were tested comparing the PPI-R, SRP-III, LSRP, external correlates including NEO-PI-R, types of aggression, and antisocial behaviours. There was evidence to support a four factor structure which has been mentioned previously in the literature, as well as evidence for a two factor structure based on exploratory factor analysis. The findings support a 'coherent' structure to several self-report measures of psychopathy that is consistent across the measures, as well as support for relationships with external correlates and measures of 'normal personality'. Some of the criticisms levelled by the authors are that these self-report measures are not measuring the same construct as the PCL-R.
Sellborn, et al.	2005	281	Student	PPI	Study provides evidence of construct convergent and divergent validity of the When compared to a measure of normal personality traits associated with psychopathy, MMPI-2, the PPI performed well providing evidence for concurrent and discriminate validity. The study demonstrated a two factor structure of the PPI correspond well with the correlates associated with each factor. PPI-1 traits negatively correlated with anxiety and fear, as expected, and PPI-2 correlated with anti-social traits as measured by the MMPI-2
Sellborn and Verona	2007	95	Student	PPI	Study assessed the relationship between psychopathic traits and executive functioning. Global scores revealed deficits in response inhibition but general executive functioning. PPI-2 was closely associated with general executive dysfunction and response inhibition however PPI-1 was correlated with enhanced executive function with the exception of response inhibition.
Smith, Edens, and Vaughn	2011		Mixed Student/ Foster Care/Juvenile Justice System	PPI-SF	Several indices were explored exploring correlations between PPI-SF 1 and PPI-SF 2. PPI-SF1 did not correlate with most of the indices, measuring only appreciable correlations hypochondriasis (-.33), Extroversion (.35), Perceived stress (-.28), ASPD Narcissism (-.31), BSI Global Severity (-.28). PPI-SF Factor 2 correlated with several indices including Mach IV (.50), Deceptive Practices (.28), Depression symptoms (.30), ASPD(.32), Perceived stress (.33), prior arrests (.29), APSD Narcissism (.49), APSD Impulsivity (.55), APSD Callous/Unemotional (.57), BSI Global Severity (.53), BSI Hostility (.45) and self-reported delinquency (.36) as well

					as MAYSI Drug/Alcohol abuse (.32). Again provides evidence for a two factor structure, as well as primary and secondary variants of psychopathy.
Uzieblo, Vershuere, and Crombez	2007	596	Mixed Student/ Offender	PPI	Evidence supports the construct validity of the PPI. Both samples indicated low activation of the BIS in relation to PPI-1 scores. Anxiety was controlled for via Anxiety measure and the results were correlation was still significant and robust. PPI-I was also related to thrill seeking, and BAS-Drive. Evidence of difference across samples for PPI-2 for a moderate correlation between BAS and antisocial and impulsive features in inmates but not the student sample suggesting that the PPI may be sensitive enough to distinguish between different types of sub types of psychopathy.
Uzieblo, Verschere, Van den Bussche, and Crombez	2010	675	Community	PPI-R	Examination of the two factor structure of the PPI-R in a community sample. Two factor structure was not supported in a community sample, however the PPI-R demonstrated convergent and discriminant validity with LSRP and Youth Psychopathic Traits Inventory, as well as external correlates such as Empathy, Anxiety, Drug Abuse, Delinquency, and Hostility. Authors suggest that confirmatory factor analysis may not have been an ideal means of measuring the two factor structure; but that there is work that needs to be completed to improve the PPI-R, as previous research suggests the Cold-heartedness scale seems to 'problematic' when compared with the rest of the measure. It should also be noted the LSRP has been frequently criticized in several studies as only correlating with Factor 2 traits, including PPI-R2 traits which have impacted results.
Vaughn, Newhill, DeLisi, Beaver, Howard	2008	94	DYS Residents	PPI-SF	In a sample of female delinquents PPI-SF1 factors of narcissism and carefree non planfulness were associated with violence and theft, the features associated with psychopathy did not correlate with drug abuse. This study fairly contradictory to other research which suggests a relationship with PPI-SF2 and violence, drug abuse, and

					other antisocial behaviours. However these differences may be indicative of the sex differences seen elsewhere or due to the use of the PPI-SF which may not be as reliable or valid as the full versions.
Vaughn, Listchge, DeLisi, Beaver and McMillien	2008	404	Foster care	PPI-SF	PPI-SF traits of narcissism, extraversion, unemotionality and the PPI-SF 1 were significant, but inconsistent risk factors for criminal behaviour and further involvement with the criminal justice system. This includes a relationship between APD and psychopathic traits and of particular interest, it demonstrated predictive validity of assault with a weapon.
Vidal, Skeem, and Camp	2010	188	Student	PPI-R	Modified PPI-R scores (to control for anxiety) suggest individuals who score higher on the PPI-R are less able to comprehend or manage emotion. Further, they show reduced emotional intelligence. And this inability to manage or appreciate emotion is associated with PPI-RII, not one.
Visser, Ashton and Pozzebon	2012	355	Student	PPI-SF	Exploration of the Stress Immunity Scale to explore role of Anxiety in psychopathy. SRP-III and PPI-SF total scores correlated well (.69), Cold-heartedness and Callous Affect (.51), Machiavellian Egocentrism and Interpersonal Manipulation (.65) to demonstrate that the scales are measuring a similar construct. What was found, ultimately was that Stress Immunity did not correlate with other factors associated with psychopathy and may not be a prototypical feature. An alternative explanation may be that the feature may be prototypical of Primary psychopathy but not secondary psychopathy, where Anxiety is a fairly common feature.
Warren and Clabour	2009	103	Student	PPI-R	Correlations between PPI-R and indirect aggression as external correlates of psychopathy including Social Exclusionary behaviour which correlated with PPI-R 2 (.30) in particular: Machiavellian Egocentrism (.44) which also correlated with Guilt Induction (.34), Blame externalization (.28), Malicious humour correlated with PPI-R 1(.34), in particular Social influence (.36) and Stress Immunity (.20) admittedly this correlation is particularly weak.

Warren and Clabour	2009	201	Student	PPI-R	As with previous study, similar results were found for the indirect aggression correlations. In addition, Physical aggression was correlated with PPI-R2 (.34), as was verbal aggression (.45), Thus demonstrating external correlates related to psychopathy may be related differentially to the two factors structure of the PPI-R, providing evidence for the two factor structure as well as possible variants Primary and Secondary Variants of psychopathy.
Wilson, Miller, Zeichner, Lynam and Widgier	2010	116	Student	PPI-R	PPI-R correlated well with the SRP-III (.80) total scores. PPI-R total scores correlated with EPA sub scales that explore external correlates associated with psychopathy such as Self-assurance (.43), Invulnerability (.42), Dominance (.48), Thrill-seeking (.67), Manipulation (.56), Self-centeredness (.47), Arrogance (.33), Callousness (.45), and Rashness (.57), correlated with EPA total (.78). Similar performance for the SRP-III, however the LSRP did not perform nearly as well as the other assessments. When exploring the individual factors, the PPI-R again demonstrated a two factor structure. Of particular interest were that externalising correlates associated with PPI-I were particularly well correlated providing some evidence for the two factor structure as well as evidence for the 'better adjusted' Primary psychopathy construct. For example, self-assurance (.68), Invulnerability (.64), Dominance (.58)
Witt, Donnellan, Blonigen, Krueger, and Conger	2009	304	Student	PPI-R	MPQ and PPI-R Factor scores were strongly correlated with PPI-R1 and MPQ 1 (.72), and PPI-R 2 and MPQ 2(.76) demonstrating that the PPI measures a psychopathy construct similar to that which can be measured via normal personality assessment tools.
Yokata	2012	160	Student	PPI-R	Exploratory factor analysis to confirm a 3 Factor Structure of Psychopathic traits in a Japanese sample yielded results that were marginally different from that of North American samples. The author suggests that the role of social structure and influence may impact characteristics of psychopathy. Also found the LSRP was less reliable for use with the Japanese sample, a common, concern, however, across North American samples as well as it does not seem to have a particularly discriminate factor structure.

Witt, Donnellan and Blonigen	2009	299	Student	PPI-R	Exploratory factor analysis between a new measure of Fearless Dominance and Impulsive Antisociality based on measures of normal personality including : HEXACO, and NEO-PI-R and FFM Expert Generated Profiles of Psychopathy was compared with the PPI-R which has a two factor structure said to measure the same constructs. IA loaded on to Blame Externalisation, Machiavellian Egocentricity, Rebellious Non-Conformity, and Carefree Non-planfulness. Fearless Dominance loaded on to Fearlessness, Stress Immunity, and Social Influence, the results were consistent with previous research suggesting a two factor structure.

4.10 Summary of key findings

There were several key points that emerged from the systematic review of the research conducted that are highlighted below:

- The PPI and derivatives measure psychopathic traits in both offending and non-offending samples
- PPI and derivatives most often demonstrated a two factor structure identified as PPI-1, Fearless Dominance and PPI-2 Antisocial Impulsivity. Other factor structures that emerged less frequently were suggestive of variation in psychopathic traits based on sex differences as well as offender/non offender sub group differences.
- The two factor structure is said to provide evidence of the existence of primary and secondary psychopathy sub-types. This is, in part, due to the fact that the two factors do not correlate with each other, and the external correlates of psychopathy differentially correlate with the two factors.
- The PPI-1 is said to comprise traits that are demonstrative of being well adaptive including stress immunity, dominance, and social control. This factor correlates with primary psychopathy. These factors predictably correlated

negatively with anxiety, fear, and antisocial features consistently such as maladjustment, poor socialisation, drug/alcohol abuse, anxiety, depression, suicidal ideation, violence/poor social relationships. Whereas PPI-2 correlated positively with the above mentioned antisocial features but not with the adaptive features associated with PPI-1. In fact, in most research the PPI-1 and PPI-2 did not correlate with each other well, demonstrating a divergent 2 factor structure that exemplifies the proposed primary (PPI-1) and secondary (PPI-2) psychopath in the literature discussed in the Introduction.

- Sex differences in how psychopathic traits manifest in males and females suggest that females typically engage in fewer anti-social behaviours such as violence and criminality but more of the indirect aggression (isolating others, social dominance and control over others). The factor structure of psychopathic traits tends to differ when considering males and females in a sample, suggesting that the manifestation of traits varies across the sexes with males being more prototypical and the variance in females being less predictable, including external correlates being differentially associated with females who score higher on psychopathy. For example females were not more likely to engage in drug and alcohol abuse even if they scored higher on the PPI-2 than average. However, there is substantially less research conducted with female participants, so these results need further confirmation.
- The two factor structure that emerged is said to be similar, but not identical to the two factor structure that is measured by the PCL-R. Similarly, the PPI and derivatives are said to be measuring a similar, but not identical psychopathy construct to that the PCL-R.
- The PPI and derivatives correlated well with normal measures of personality, including sharing a similar two factor structure with measures such as the NEO-PI-R and MPQ which may be used to measure normal personality traits

that are associated with psychopathy including the five factor structure of personality. This included external correlates associated with features of psychopathy, such as positive correlations between extroversion and low neuroticism when examining the PPI-1, and positive correlations with anxiety, low mood, and introversion and negatively with agreeableness for PPI-2. Further, the PPI and derivatives generally performed well against other self-report measures of psychopathy. However, there are inconsistencies in how it performs against the LSRP scale. The criticism from authors however, was overwhelming against the LSRP which is said to be flawed, does not have a distinct two factor structure and most of the subscales tend to correlate with the anti-social features or PPI-2 or PCL-R 2 features associated with psychopathy, to the exclusion of Factor 1 features, entirely.

- The PPI and derivatives are said to measure variants of psychopathy well, in large part because they are said to measure a purer form of psychopathy that focuses on the Cleckley/Hare model (nomological network) than the PCL-R. However, it should be argued that all measure variants of psychopathy and that one is not superior to the other as there is no evidence to support superiority of a measure across variants at this time.
- PPI and PPI-R were more highly regarded than the PPI-SF which was said to be less valid and reliable in terms of the factor structure that emerged, as well as underperformance when considering external correlates. Further, the PPI-SF did not perform well when compared with the PPI that it was derived from, suggesting it does not capture the traits and factors associated with psychopathy, as well. It is likely that the PPI-SF can be used as a 'quick screen' tool but should be followed up with something more comprehensive, or failing that used in conjunction with a suitable measure of normal personality that also measures psychopathic traits well such as the NEO-PI-R.

- The PPI and PPI-R are said to be measuring very similar traits and constructs and the indication is that they are measuring the same construct; changings made to the PPI to develop the PPI-R have not altered the assessment in a detrimental way. The same could not be said for the PPI-SF which did not perform as well or as consistently as the PPI or PPI-R in studies.
- There is a lack of research comparing how the measures perform against each other, however, with one study comparing the PPI to the PPI-R and one study comparing the PPI to the PPI-SF. This is problematic, particularly since much of the literature suggests that these tools are measuring the same construct, with some going so far as to suggest that since the PPI is valid in reliable, it can be assumed the PPI-SF is, as it was derived from it
- Often, the focus of the research studies tends to be on the PPI-2, as it tends to correlate more closely with the construct of psychopathy as measured by the PCL-R. Discussion of the PPI-1 tends to be limited by comparison across most of the studies. This is likely due to the focus on the PCL-R nomological net, which is more consistent with the PPI-2 factor, than the PPI-1. More research needs to be conducted to examine how the PPI-1 traits present in different samples, as well as measuring external correlates associated with these factors, other than lack of anxiety.
- Researchers have frequently suggested that when using the PPI and derivatives relying on the global score exclusively may cause researchers to lose out on valuable information about the two different factors that underscore the measure and as such, researchers are encouraged to explore the two factors independently, where appropriate.
- The Cold-heartedness scale does not receive much consideration or notice by virtually any of the researchers. It tends not to load on to the traditional two factor structure and is therefore largely overlooked beyond the

acknowledgement that it is a sub-scale that does not load onto the typical two factor structure of psychopathic traits.

Do the PPI, PPI-R and PPI-SF demonstrate construct validity?

During the course of the research, there was no published evidence to suggest that the PPI and its derivatives fail to measure psychopathic traits as outlined by the Cleckley/Hare model. What has emerged from the systematic review is that the PPI and derivatives seem to be capable of measuring sub-types or variants of psychopathic personality construct that are associated with psychopathy and would be classified as high functioning, non-offender, but share features with this classic conceptualisation of psychopathy as well as the secondary sub-type of psychopathy more closely associated with the PCL-R and anti-social traits. These sub-types correspond to the primary and secondary variants of psychopathic type Karpman (1941) identified early on. Those of the primary type are not only high functioning, but seem to be very well adjusted. Scoring low on measures of Anxiety and high on measures of Extroversion, for example. Whereas those that tend toward Secondary psychopathy seem less well adjusted, scoring higher on measures of Neuroticism, anxiety and antisocial behaviours, including criminality, academic and other forms of misconduct as well as drug and alcohol abuse and misuse.

According to Gray et al. (2011) the PPI and derivatives may be measuring a purer former of psychopathy than the PCL-R does as it adheres more closely to the original conceptualisation, particularly the personality and affective traits associated with the Cleckley/Hare model than even the PCL-R has done. This was similarly previously suggested by Uziebo et al. (2009) and argued again by Lilienfeld et al. (2012) in response to criticism from Miller and Lynam's (2012) meta-analysis of the PPI and derivatives that suggested that because the PPI is measuring a type of psychopathy

similar, but different to the PCL-R it was somehow less valid and that the PPI-Factor 1 does not measure traits associated directly with psychopathy. This suggestion, however, again is unsupported by the Cleckley/Hare model which indicates that not all psychopathic individuals are prone to anti-social behaviour, including crime, but some sub-groups may be higher functioning and better able to 'blend' in with regular society, than their lower functioning counterparts (Lilienfeld et al. 2012). The source and extent of these variations have not been established as yet, Karpman (1941) theorised that the primary psychopathy, the type that is well-adjusted, aetiology, may be genetic, and secondary psychopathy may be the consequence of parental neglect/abuse, poor socialisation, etc.

What has emerged is that due to the heterogeneity of the psychopathy construct, the nomological network requires revision and re-evaluation (Cooke and Skeem 2010) to reflect these variants. There needs to be greater consideration of some of the external correlates that have recently been tapped into such as the neurocognitive deficits which Lilienfeld and Widows (2005) acknowledged previously, as well as development and evaluation of the variants or sub-types that seem to be present. This requires more research and evaluation; particularly evaluating the higher functioning, stress immune, dominant form of psychopathy that has emerged from some of the research. What often has emerged from the literature, including that which explores the external correlates that many researchers examine the traits closely aligned with the PCL-R, such as anti-social behaviour, drug/alcohol abuse, social/academic and other forms of misconduct, as well as criminality; often to the exclusion of stress immunity, dominance, and social ability because that is not consistent with the PCL-R derived nomological net, therefore it is not consistent with psychopathy (Miller and Lynam 2012), which again, provides evidence for Skeem and Cooke's (2010) argument that the nomological network is under threat, and there is a tautological argument for suggesting that psychopathy is what the PCL-R measures, rather than psychopathy is a

disorder that includes affective interpersonal and behavioural deficits that the PCL-R captures a variant of, that the PPI and derivatives capture a variant of, that the SPR-III captures a variant of, and that there is convergence and divergence depending on sample, sex, and individual differences that require exploration.

A substantial issue that has emerged from this review is that there is the construct of psychopathy heterogeneous and dimensional in nature, not a unique taxon and it is difficult to suggest that one measure is superior to others for identifying psychopathy or psychopathic traits as a consequence as the measures seem to be capturing variants of psychopathy. The construct of psychopathy is, by its very nature, heterogeneous, not homogeneous and at present, the majority of psychopathy related measures have strengths and limitations associated with them. The least favourably viewed measure, at present is the LSRP which frequently received poor 'reviews' during the course of research and theoretical discussion.

Research conducted with the PCL-R and SRP-III suggests that the PPI and derivatives is measuring a similar construct. PPI and its derivatives correlates well with the PCL-R, on average (r=.5), in particular, but also with the SRP-III, on average (r=.6), but less so with the LSRP, which, much of the research regarding suggests the LSRP is flawed, in that it only seems to measure Factor 2, which is associated with anti-social behaviours, anxiety and neuroticism, despite the author's assertion it also has a two factor structure.

While there are technically three factors associated with the measure, Fearless Dominance, Impulsive Antisociality, and Cold-heartedness is actually one of the traits associated that does not currently load on to the standard two factor structure, so it is occasionally listed as a factor, by some), the research largely supports a two factor

structure of Fearless Dominance and Impulsive Antisociality, which are said to correspond well with the two factor structure measured by the PCL-R, as well as the two factor structure of the and SRP-III. The LSRP is said to have a two factor-structure, however, what emerged from the research was that it is a poorer measure of psychopathic traits, for measure the two factor structure and that both factors tend to correlate with features of secondary psychopathy, or IA, rather than discriminating. The research is fairly consistent, however, there are are arguments suggesting that there is a three factor structure and four factor structure of psychopathy (See Chapter 1) however, the overwhelming majority of the research explored via the systematic review literature suggests this two factor structure. Uzieblo et al. (2009) are particularly concerned that this factor is often overlooked in research and suggest that the PPI and derivatives should be revised to either make Cold-heartedness more consistent with the nomological network or possibly exclude it entirely.

There are dearth of longitudinal studies exploring the long term effectiveness of the PPI and derivatives as measuring psychopathic traits over time. This is an area that requires further exploration.

While all three have demonstrated validity, they measures should not be equated with each other. The PPI-SF underperforms when compared with the PPI and PPI-R. There is concern about the two factor structure associated with this measure, and in particular if all three are capturing psychopathic traits in a similar way. This is one area where the PPI-SF is said to fall short, in terms of being as consistent and reliable a measure as the PPI and PPI-R. Another area of concern is that the PPI-SF has most frequently been validated, almost exclusively, with youth samples, whereas the PPI and PPI-R have been validated across offender, community and student samples. There has been very little work that examines how each of the versions corresponds to one another, but what has emerged is that the PPI and PPI-R are measuring the same

construct and factor structure, and that the PPI-SF, whilst measuring psychopathic features, is not as consistent or reliable as the PPI and does not adhere to the same two factor structure. It is unclear if this is a consequence of the sample that tends to be utilized or if this is a consequence of it being such an abbreviated version of the assessment. There is a need for more research to be conducted in this area.

4.11 Critical review

The PPI and derivatives have demonstrated construct validity across a variety of samples, however, issues within psychopathy based research have limited the focus, often testing against the PCL-R, raising concerns about bias, and unintended alterations to the nomological network that have driven the focus away from testing the Cleckley/Hare model of psychopathy, instead focusing on a PCL-R based nomological network. The PPI and derivatives are an effective method of measuring personality traits associated with psychopathy in a variety of samples. It requires limited experience with psychometric tools, but a good understanding of the nomological network of psychopathy and the issues in psychopathy based research to be used effectively. The assertion that it is the 'gold standard' for measuring psychopathic traits in a non-offending sample seems premature, and based upon the fact that is has been well validated against the PCL-R. For research purposes, the major "concern" about which version of the PPI to use would be the location of the sample. If a researcher has a strictly North American sample, the PPI or PPI-R are both suitable, if working with an English-speaking but International sample, the PPI-R is more suitable as it has been altered to remove language more common to North America. Similarly if working with offenders, or individuals with co-morbidities that may impact reading ability, the PPI-R is more suitable as it has a reduced reading level

(Lilienfeld and Widows 2005). The use of the PPI-SF should be considered more carefully in terms of the research aims, objectives and sample as it has not been demonstrated to be as reliable or consistent as the PPI or PPI-R (Kastner et al. 2012). This systematic review's findings are similar to Miller and Lynam's (2012) in that there was strong evidence for the PPI-2 measuring psychopathic traits consistent with the PCL-R and as well as self-report measures of psychopathy such as the SRP-III. There is less evidence to report or consider in relation to the PPI-1 other than it correlates negatively with anxiety, and fear, and positively with extroversion and openness and provides evidence for a higher functioning sub-type of psychopathy, similar to the primary psychopath proposed by Karpman (1941) which there is growing research evidence for (Patrick, et al. 2010). However, Miller and Lynam (2012) suggest that PPI-1 traits are not consistent with the PCL-R nomological net, therefore are not traits of psychopathy. This logical seems flawed, and provides evidence for Skeem and Cooke's (2010) concerns that research and theory are equating the PCL-R measurement of psychopathy with the nomological network which is not appropriate. Hare, et al. (2010) acknowledged that this is in error and Lilienfeld et al. (2012) argued that the Cleckley/Hare model, the foundation of psychopathy research proposed that psychopathy could and did include high functioning individuals who were non-violent, non-offending, stress/anxiety immune, and socially well adapted and suggests that Miller and Lynam (2012) are not considering the nomological network derived from the Cleckley/Hare model.

Further differences in the conclusions this review and that of Miller and Lynam (2012) emerged in terms of heterogeneity across studies. For example, there is little discussion of the differences in how the versions of the PPI vary in performance in Miller and Lynam's (2012) meta-analysis but what has emerged is that the PPI-SF is not as valid or reliable as the PPI or PPI-R and should be used with caution. Further that there are sex differences in how traits associated with psychopathy manifest in males and females,

with females most often presenting with fewer of the antisocial features, even in offending samples. While a two factor structure most often emerged there was evidence to suggest that cultural, sex differences, and sample type may impact the underlying factors that emerge due to differences in how traits manifest in different groups across studies (See Table 4-1).

Both this systematic review and the meta–analysis have similar limitations. Both consisted exclusively of published literature which is said to lead to bias and possibly inflated effect sizes including over inflating positive results that may not be consistent with how the PPI and derivatives actually perform. Contacting key authors for additional, unpublished manuscripts may provide some additional information, however, due to time constraints, and limited responses from researchers it was necessary to complete the systematic review without these studies.

A further limitation of this systematic review is the potential for bias by the author. Efforts were made to adhere to a similar structure to that of Miller and Lynam's meta-analysis, as well recommendations by the Cochrane Review (2008), Hemingway (2001), Torgerson (2003) and Gagnier et al. (2012) to limit these biases, however.

Chapter 5. Exploring disgust sensitivity and psychopathic traits in a subclinical sample via an emotional Stroop and self-report measure of disgust sensitivity.

A prototypical feature of psychopathy is a poverty of emotionality (Cleckley, 1976) it is theorised that this feature extends across aversive emotions, in particular, while positive emotions seem to remain intact. Fear including anxiety and worry, shame,

remorse and guilt are all said to be blunted in individuals who have been identified as psychopathic (Witt, et al., 2009; Lilienfeld, et al. 2012) Curiously, aggression, also an

aversive emotion, is often considered to be higher than average in psychopaths (Falkenbach et al. 2007). How psychopathic individuals respond to the emotion disgust remains largely unknown. This dichotomy of a poverty of some aversive emotions and a seemingly heightened experience of others, such as aggression suggests different neurological pathways for the generation of some emotions (Shamay-Tsoory et al.2009), and that psychopaths' experience of emotion seems to be particularly unique (Blair and Mitchell 2009).

The need to explore disgust in relation to psychopathic traits may not seem apparent. However, disgust is a complex dimensional emotion that is said to govern a variety of behaviours ranging from avoidance of contaminants through to revulsion from witnessing moral transgressions (Borg et al., 2008). Disgust manifests not only from exposure to harmful agents that may cause illness or injury to the person, but also from the actions of others(Olatunjui et al., 2009). For example, individuals will often not engage in behaviours that are deemed morally reprehensible (Bork, et al. 2008), as these too illicit disgust. Sexual behaviour is theorized to be, in part, moderated by disgust sensitivity (Blair 2007). Because psychopathic individuals are often viewed as more likely to engage in 'morally reprehensible' behaviours, including sexually 'deviant' behaviours (Mokros et al. 2011) it may be that their experience of disgust sensitivity, like other aversive emotions, is also attenuated. It is necessary to ascertain if the experience of disgust is reduced in individuals that may be deemed psychopathic as this may aide in understanding of why psychopathic individuals engage in behaviour that is deemed morally and socially reprehensible. Further, it may help to

explain the theoretical relationship between psychopathy and sadism. As psychopaths are assumed to be more inclined towards sadistic behaviours; disgust sensitivity may be involved in determining what types of sexual behaviours may be considered acceptable and unacceptable by the psychopath in terms of how repulsive or morally reprehensive the act is perceived to be. As the current research explores psychopathic traits in otherwise healthy individuals it may prove useful to also explore the experience of disgust as this may help to determine if psychopathic traits and disgust are negatively correlated as well as examining the role disgust may play in moderating atypical sexual behaviour and fantasy as part of or exclusive of psychopathic traits.

5.1 Emotion and psychopathy

According to the Cleckley/Hare model of psychopathy, psychopathic individuals experience impoverished emotional states related to aversive emotions (Kirsch and Becker 2007). Not only does it seem psychopathic individuals do not experience the full spectrum of emotion, but they have difficult recognising these emotions in other people (Jackson and Richards 2007). Social interactions require the ability to gauge others' emotional responses effectively. For the psychopath, social interactions may become strained or hostile, in part, due to the fact that they misinterpret the social cues displayed by others via facial expression (van Honk et al. 2006), tone of voice and other means of conveying emotion (Hicks et al. 2006: Osumi et al. 2007). Cleckley had often been quoted as saying, "They know the words, but not the music." (p.) based on his observations of psychopathic patients. Cleckley observed that his patients seemed to appreciate the semantic meaning of emotionally laden words and phrases, but that due to their inability or their limited ability to experience and appreciate, the emotions themselves, they often mimed what was expected of them, never fully appreciating the emotionality of a situation. Further, they would often engage in behaviour that was not appropriate because of an inability to appreciate the emotional toll it may take on others. Cleckley frequently observed that while many of his psychopathic patients

were not criminals, they were socially inept and inappropriate. Manipulative, conning, promiscuous, difficult, self-absorbed and self-serving, with little regard for the impact their actions would have on others.

Similarly, shortly after Hare (1993) began his career in the Canadian corrections system, he observed offenders engaging in inappropriate, in particular, conning and manipulative behaviour with an ends towards self-aggrandisement, as well as achieving some sort of nepotism from officials, including Hare. Despite what was often obvious chicanery, the offenders were shameless and unrepentant once caught. Additionally there seemed to be an inability to learn from the experiences, and consequently, adopt a different tack or approach. These early experiences, along with the observations of Cleckley inspired Hare to construct the PCL and eventually the PCL-R. The PCL-R is used to diagnose psychopathy in a forensic or clinical setting; it requires specialized training, and consists of a comprehensive case history and evaluation as well as a structured interview schedule where an individual is assessed for key traits associated with psychopathy (Hare 2003). The development of the PCL-R has been integral in enabling, not only clinicians, but researchers to explore and examine the traits associated with psychopathy in offending samples substantially improving understanding of psychopathy in offending samples (Skeem and Cooke 2010).

There have been several studies exploring the emotional deficits associated with psychopathy in offending samples (Stinson et al. 2005; Mitchell et al., 2006; Hoff et al. 2009). While positive emotions seem unaffected by psychopathy, aversive emotions, for the most part are attenuated (Wallace, et al., 2009). The exception to this is aggression which is often heightened in psychopathic individuals (Cima and Raine

2009). Psychopaths are known to engage not only in reactive aggression but instrumental, or goal directed aggression (Cima and Raine 2009).

5.2 Psychopathic traits, impoverished emotion and the impact on behaviour

The impact of emotional deficits is said to be a key contributing factor in inappropriate behaviour exhibited by psychopaths (Coid and Ulrich 2010). A failure to appreciate social norms, combined with a selfish, manipulative and self-centred behaviour along with an inability to appreciate the emotional states and experiences of others due to a poverty of emotion experienced by one's self leads the psychopath to act in ways that are not only idiosyncratic, but hurtful and, at times, potentially dangerous to others, as well as themselves (Yang et al. 2005). It is theorised that the poverty of emotions extends to diminished moral development making it easier for the psychopath to engage in behaviour that is unsavoury and even criminal (Glenn et al. 2009).

From research and clinical observation, assumptions have been made about the relationship between psychopathy and violent behaviour. Criminal psychopaths are believed to engage in what is known as instrumental aggression (Cima and Raine 2009). Psychopaths will use violence as a way of achieving a particular goal or objective. If manipulation, cohesion or threats do not work, things may escalate towards violence for the sake of attaining a desired goal. Further, psychopaths are believed to be more prone toward sadistic violence (Kirsch and Becker 2007).Experts frequently struggle to conceptualise sadism, despite a formal definition provided for what sadism is via the DSM-V, it remains an ephemeral concept hard to pin down (McLawsen et al. 2008). Nevertheless, theory and clinical observation suggest a relationship exists (Kirsch and Becker 2007).

Again, how these deficits may impact individuals that exhibit a number of psychopathic traits, including individuals that may experience some form of subclinical psychopathy remains unclear and requires investigation.

5.3 Causes of attenuated emotion in individuals with psychopathic traits

Understanding the cause of the emotional deficits and/or dysregulation in psychopathy is essential not only for managing the disorder and developing treatment protocols but this also aides in the understanding of how healthy individuals process emotion and can lead to a better of understanding of emotion, personality and personality disorder (Malterer et al. 2008).

In healthy a participant, that is individuals not suspected to have psychopathy or a preponderance of psychopathic traits, research suggests that attention may be modulated by emotion. Specifically visual awareness and attention may be modified by emotionally valenced stimuli (Blair and Mitchell 2009). More specifically, attention can be captured and dominated by unpleasant stimuli, to the exclusion of other forms of emotionally valenced stimuli (Sheth and Pham 2008). Research conducted with individuals who experience higher than average anxiety and fear, such as those with anxiety disorders and Obsessive Compulsive Disorder (OCD), participants again will over-attend to stimuli that is aversive in nature (Olatunjui et al. 2007). Conversely the expectation would be that those who exhibit a preponderance of psychopathic traits would not experience these deficits because they are not encumbered by the emotion associated with the stimuli. And for those that have a preponderance of Factor 1 traits associated with psychopathy or primary psychopathy, there is research to support this (Mitchell et al. 2006). Paradoxically, a lack of emotion actually provides an advantage to the individual with a preponderance of psychopathic traits when confronted with

certain forms of decision making. Specifically, Osumi and Ohira (2010) found that those with a preponderance of psychopathic traits were able to make more rational decisions, even if they were deemed 'unfair' financially to the participants. Participants' decisions to accept an unfair or fair offer financial incentive was positively moderated by psychopathy levels. Not only did those who score high on psychopathy respond more rationally, they did not seem to experience an adverse physiological response to unfair offers that the participants with low scores experienced. The emotional detachment demonstrated by some with a preponderance of psychopathic traits seems to provide an advantage when it comes to decision making if there is generally an emotional investment of some kind involved, as the individuals with more psychopathic traits may be able to make these decisions without experiencing the emotional interference low scorers seem to.

Research conducted by Yamasaki and La Bar (2005) with healthy participants suggests that attention and emotion are regulated by the prefrontal cortex. Specifically they found that the dorsolateral prefrontal cortex is implicated in attention and the ventrolateral prefrontal cortex may be involved in emotional arousal. It also appears that specific regions can be deactivated or inhibited depending on the stimuli a participant is exposed to with emotional stimuli overriding attentional stimuli and depending upon the complexity of the cognitive task, attentional stimuli reducing neural responses to emotional stimuli. Yamasaki and La Bar (2005) hypothesise that there is a reciprocal relationship between the dorsolateral and ventral prefrontal cortex that provides a basis for neural activity for cognitive/emotional interactions and that this may help to explain dysregulation in various mental disorders that have an affective component to them. Mitchell et al. (2006) found that in healthy controls, responses to emotional stimuli resulted in response latencies far greater than psychopathic counterparts whose attention was unaffected by emotionally valenced stimuli in an Emotional Interrupt Task experiment. They hypothesised that this was

the result of dysfunction in emotional processing by those with affective disorders who do not attend to emotionally valenced stimuli in the same way as healthy controls. They hypothesise that the amygdala is responsible for the regulation of attention including biasing attention towards that which is emotionally salient to the individual and via conditioning/learning. The amygdala seems to responsible for 'biasing' attention to the emotional at the expense of the neutral even if the emotional stimuli is peripheral, in healthy subjects. However it could be argued that psychopathy, where emotion is said to be deficient in some subtypes, attending to and appreciating emotionally valenced stimuli has not be learned therefore is neglected as the amygdala does not function in the typical fashion. Interestingly, Shamay-Tsooryet al. (2009) have found that empathy seems to have a double disassociation system that engages the prefrontal cortex differentially, with the ventromedial prefrontal cortex responsible for cognitive empathy (perspective taking) and inferior frontal gyrus responsible for emotional empathy and emotion recognition. In psychopaths, cognitive empathy is believed to be in tact, however emotional empathy appears to be lacking (Blair 2008). Furthermore, Blair (2008) posits that the dysfunction of the amygdala, in particular the ability to learn via stimulus reinforcement through conditioning prevents psychopaths from experiencing, attending to and processing emotions correctly; this includes aversive stimuli as well as emotional empathy. This research supports the notion that psychopathy is a consequence of neurocognitive deficits, in particular global dysfunction of the paralimbic system which is responsible for emotion regulation/experience, and attention. This in turn has informed theory that suggests that emotional and neurocognitive deficits result in attenuated morality and moral reasoning in psychopaths (Blair 2009).

While not often addressed, there is research to suggest that emotional dysregulation may also be a consequence of atypical hemispheric functioning as well as dysfunction at the inter-hemispheric level. The valence hypothesis suggests that during normal functioning the hemispheres of the brain are responsible for attending to and processing different emotions and/or different aspects of emotion with the left hemisphere responsible for positive emotion and the right responsible for negative emotion (Borod et al., 2001; cited by Rueckert and Naybar, 2008). In lesion and neurodegenerative disease studies, participants who exhibited deficits in empathy demonstrated greater deterioration in the right hemisphere of the brain, for example (Rueckert and Naybar 2008). Borkenau and Mauer (2006) and tested this theory using a lateralised emotional Stroop with healthy subjects and found that negatively valenced words resulted in greater latencies and interference when negatively valenced words were presented to the LVF (left visual field), and greater latencies and interference when positively valenced words were presented to RVF (right visual field), which provides support that, at least for semantic processing of words, the right hemisphere seems to be responsible for processing negatively valenced words, and the left for positively valenced words. According to Van Strien and Van Kampen (2009) lateralised emotional Stroop research conducted with males who scored high on positive schizotypal traits, resulted in over-attending to negative valenced emotional stimuli presented to the left visual field (LFV) demonstrating differential functioning at the hemispheric level with the right hemisphere responding in an exaggerated fashion to negative stimuli due the presence of the positive schizotypal traits. The implications of this are two-fold, first that the hemispheres seem to process emotion differentially and secondly that for individuals with emotional disorders and/or lesions/disease, emotional deficits or exaggerated attendance to specific emotional stimuli seem to occur when the hemispheres either dysfunction or become damaged.

Interestingly, there is research that suggests that not only do the hemispheres function differently but for psychopathic individuals there are contradictory findings indicating that inter-hemispheric interactions via the corpus callosum may either be enhanced or diminished by the presence of psychopathic traits. Research is equivocal on the matter, with Raine (2003) cited by Hiatt and Newman (2007) suggesting that increases in collosal volume result in more efficient functioning of the corpus callosum and the work of Hiatt and Newman (2007) suggesting the opposite that for offending psychopaths demonstrated deficits in performance when compared to controls. However, this study did not explore the psychopathic subtypes beyond examining anxiety levels and assumed that the non-offending sample did not exhibit psychopathic traits.

5.4 The possible relationship between psychopathic traits and disgust sensitivity

Most often, threat –based stimuli such as stimuli that is meant to induce fear is used to explore the emotional deficits associated with psychopathy (Blair and Mitchell 2009). As fear and disgust are different emotions it cannot be assumed that because both are aversive they would be experienced in the same way (Borg et al. 2008). As mentioned, emotions that have dimensional components such as empathy, have divergent neurocognitive substrates and an emotion as complex as disgust should not be assumed to have the same or similar pathways as fear/threat stimuli tend to evoke. Similarly, it cannot be assumed that simply because disgust is aversive that an attenuated response will exhibited by those who demonstrate psychopathic traits, not only because of the dimensional nature of psychopathy including subtypes but because individual differences help to shape and differentiate disgust sensitivity (Mataix-Cols, An et al., 2008). Furthermore, not all aversive emotions are attenuated in psychopathic individuals, aggression, for example, is heightened. Consequently, the role of disgust

and disgust sensitivity requires empirical study, not only in relation to psychopathy but to determine more precisely what role it may play in atypical behaviours such as atypical sexual fantasy and practices, including BDSM.

Mataix-Cols, An et al. (2008) found that in healthy participants the level of disgust sensitivity and anxiety positively correlated with neurological activity, specifically in regions of the prefrontal cortex with increased activation in those who experienced a greater sensitivity to disgust via both self-report and neurological and physiological response to disgusting images. While non-specific in terms of locus, this provides evidence of pre-frontal involvement in disgust sensitivity; a region known for dysfunction in individuals who score higher on measures of psychopathy. This also provides evidence for reliability and validity of the self-report Disgust Sensitivity Scale, as results were consistent with physiological responses to disgust, as well as it was sensitive to the individual differences of participant's reports of disgust sensitivity in healthy subjects.

Preliminary research by Olatunjui et al. (2007) into disgust sensitivity and attentional bias found that attentional biases for disgust were less automatic than they are for fear based stimuli in emotion/cognitive attention based research, and that the only participants that were easily disgusted were preoccupied with disgust based stimuli presented via distracter task than those with more typical in their response to disgust. Furthermore, it was found that those who experienced elevated levels of disgust sensitivity had more difficulty disengaging from disgust based stimuli and refocusing on the tasks during the research. This research again demonstrates support for the use of self-report with healthy samples is it again seems to capture a measure of disgust similar to what the participants demonstrated when exposed to disgusting images and was consistent with their self-report. Both of the above studies also found that self-

report anxiety was higher for those participants who experienced higher levels of self-reported disgust as well as neurologically and physiological responses to disgust.

Global functional neuroimaging work by Borg et al. (2008) found differential activation of the brain when different dimensions of disgust were presented to participants via various stimuli with morality based disgust, in the form of incest, resulting in powerful activation so the pre-frontal cortex and left temporal lobe, pathogen based disgust activated similar pathways, but also involved more of the basal ganglia, and left amygdala; this work also looked at anxiety as well as self-report and found similar findings that brain activity, higher anxiety and greater self-reported disgust sensitivity seemed positively correlated. As this looked at global functioning, it is hard to disentangle precise regions of activity based on the preliminary analyses, but it does provide support that suggests disgust is not a unitary emotion in terms of neurological underpinnings, it is multi-faceted; anxiety seems to be involved in its modulation, and that it individual differences also mediate disgust sensitivity.

5.5 Effective means of exploring emotion empirically

The Stroop effect (Ridley 1935 cited by MacLeod and MacDonald 2000) examines how automatic processing can be facilitated or hindered based on which cognitive processes are more automated than others. The classic Stroop requires that participant identify the colour a word appears in, rather than attending to the reading of the word, itself. Participants do not generally experience difficulty identifying the colour a word is printed in unless the word happens to be incongruent with the colour; the word green written in red ink will result in slowing of processing and more errors, but the word red written in red ink facilities performance and a neutral word, such as the word cat written in green ink will not hinder the identification of the colour (MacLeod and MacDonald 2000). The reason for this is believed to be automaticity inferring with what is attended to. The human brain is more inclined to read the word than to

attempt to identify the colour it is printed in as humans rely on reading more than colour identification, making that task more automatic. It is believed that the Stroop captures attention as well as automaticity in performance, though it is important to note that the mechanisms behind the Stroop are not currently understood (Power 2006).

Similarly, the emotional Stroop is a task that requires that individuals name the colour, rather than attend to the word, itself. However, in this case the word is emotionally valenced, and the interference is caused by the participant attending to the emotional valence of the word, rather than the colour it appears in. It is important to note that the term emotional Stroop is a misnomer. The phenomenon experienced is not identical to that experienced in the classic Stroop (Frings et al. 2009). There is not an incongruence between word colour and word meaning that occurs, rather the interference that occurs is a consequence of attention or over attention to the word's meaning. Despite this misnomer the emotional Stroop is considered a good measure of attendance or over attendance to emotionally valenced stimuli, depending on the research paradigm and sample involved of emotional attention (Price 2011).

There are several studies that demonstrate the emotional Stroop effect which suggest that individuals will attend to the meaning and emotion of a word, rather than the colour, resulting in increased response latencies as well as increases in errors (see Table). This work has been expanded to examine the relationships between specific emotions and their links with disorders and mental illnesses, as well as emotion and anti-social behaviour and criminal behaviours. The salience of an emotionally valenced word seems to result in response latencies; the more relevant the word to the participant, the greater attentional bias, resulting in response latencies and increased errors in performance. The salience of a particular word to an individual results in

biases. This is evident in both clinical and non-clinical samples, whereby a word that is particularly relevant to an individual will result in response latencies.

There has been substantial research that utilises the emotional Stroop to examine emotion and attention with those who experience exaggerated emotional responses due to underlying mental illness or disorder. A review conducted by Chen (2008) discusses the how the emotional Stroop has been used to explore attentional biases among those with social phobias, anxiety disorder, alcoholism, and compulsive behaviours. Research often demonstrated, depending on the effectiveness of the design, that individuals with certain types of mental illness or disorder demonstrate a bias for words that are particularly salient to them over other stimuli with greater errors and response latencies. Smith and Waterman (2004) found that sex offenders demonstrated a bias towards words that were sexual in nature including differences based on type of offense, i.e. rapists and paedophiles responded with differential biases based on the salience of the sexually evocative words employed in the emotional Stroop paradigm. Similarly they found that violent sexual offenders compared with non-violent sexual offenders showed similar biases for violent words when compared. Smith and Waterman (2003) also found that when compared with university students, violent offenders were more prone to response bias for aggressive words than their research counterparts. Price (2011) replicated the work of Smith and Waterman using the emotional Stroop design combined with functional neuroimaging techniques to capture the neurocognitive differences between sex offenders and their healthy research counter parts. Like Smith and Waterman (2004), Price's (2011) study provided evidence of biases in sex-offenders, for example youth sex offenders toward sexually salient word lists, while the results were not terribly significant they provided evidence for use of the emotional Stroop with offender samples.

There are thought to be two mechanisms beyond the emotional Stroop. The fast and slow effects (Chajut et al.2010). The fast effect is the trial dependent effect which is the reaction the individual has to the word as it is appears on the screen and is affected by an increase in arousal precipitated by the emotional stimuli (Chajut et al. 2010). The slow effect is the effect a particular word may have across trials and is theorised to be a consequence of an inability to disengage from the emotional valence of the stimuli (Chajut et al. 2010). The slow effect is of particular interest in the emotional Stroop task as it is said to demonstrate that the emotional valence of a particular word causes a general slowing down of response across a number of subsequent trials as a consequence of the participants' neurocognitive resources being allocated to the meaning of a particular word. While the cause of the slowing down is not entirely understood, the slow effect has been captured in studies of healthy participants, as well as those with mental illness disorder addiction and trauma (See Table 1). Chajut et al. (2010) argue that the reason for the emotional Stroop effect is that, under laboratory conditions, individuals are forced to 'confront' threat based stimuli rather than avoid or retreat from a threat based stimuli and that if provided a means of retreat the emotional Stroop effect may not occur.

5.6 Benefits and limitations of the emotional Stroop paradigm

There are numerous benefits to utilizing the emotional Stroop paradigm. There is substantial evidence for the presence of the effect across a numerous samples (see Table 5-1), this, despite the fact that designs are not entirely standardised (Price, 2011). The emotional Stroop is inexpensive, relatively quick to set up, easy to interpret and employ (MacLeod 1995). A number of emotions can be explored in one experimental design to examine the impact of particular emotions on disorder/illness, as well as with health participants (Chen 2008).

It is important to note that the Stroop paradigm, does have its detractors. Power and Dalgaleish (2008) point out that despite widespread use of the various Stroop paradigms the underlying mechanisms that cause the emotional Stroop effect remain unclear and as the effect cannot be readily explained the use of the Stroop should be restricted. Price (2011) would seem to disagree. She had conducted research with sex offenders using functional neuro imaging to examine the emotional salience and attention of sexually explicit words relevant to offense with this particular group. Price (2011) also explored a number of issues associated with using the emotional Stroop paradigm. Price (2011) suggests that the Stroop is an effective means of tapping into emotion, providing that experimental designs are carefully considered and potentially confounding variables are controlled for. Consistency of the words used across experiments by developing standardised words lists, as well as ensuring the words used within experiments be consistent in terms of word length and usage across conditions can provide evidence of emotional interference and attendance to emotion based stimuli. This was a key issue across studies examined with some researchers failing to provide completed word lists or developing words lists that were inconsistent in terms of word length or word usage making it difficult to determine if there were confounding variables causing differences across conditions. Similarly controlling for factors such as reading ability and age can further mitigate confounding variables in emotional Stroop designs that may result in equivocal findings. Older participants (50+) often do not experience the same degree of latencies for aversive stimuli as younger participants, for example, Ashley and Swick (2009) found that older participants did not experience response when presented with aversive stimuli to the same degree as their younger counterparts depending on the design of the research it became more difficult to induce a Stroop in older participants. They suggested that a block design may reduce the effects of age in an emotional Stroop design. Further, Price (2011) suggests that by incorporating functional neuroimaging techniques, where

possible, the attentional control mechanisms that underscore the emotional Stroop can be identified to better inform theory.

Table 5-1 Emotional Stroop Study Designs

Author(s)	Date	Sample	Design	Results
Ashley and Swick	2009	40Adults, community sample 20young(18-31) 20 older (62-80)	Block vs. Pseudo Randomised design Voice recorded responses	Both groups demonstrated emotional Stroop effect during block design but not pseudo randomised. Block design appeared to be more effective at capturing the effect as older participants did not demonstrate a 'slow effect' on mixed design. Demonstrates evidence for use of a block design when controlling for age.
Cricher and Ferguson	2011	62 University students	Block Design Response Box	Emotional valence causes interference in participants dependent upon 'mind-set' with those of an 'abstract' mind-set experiencing the greatest interference for emotionally valenced stimuli
Dresler et al.	2009	50 University students	Block Design Keyboard Response	Emotional valence causes interference, with individuals with higher than average state anxiety experience greater interference for emotionally salient stimuli
Liu et al.	2011	37 Cocaine Addicts 32 Healthy Controls	Block Design Respond via mouse	Cocaine addicts demonstrated significantly longer response latencies to cocaine related words than healthy controls
Sadeh et al.	2011	49 Adults; community sample	fMRI Study Block Design Response Box	Dimensions of psychopathy (FD, and IA) result in divergent dysfunction in cognitive and affective processing and neurological functioning during emotional Stroop task.
Wingenfeld et al.	2009	20 BPD Patients 20 Healthy	fMRI Study Block Design	BPD patients exhibited dysfunction including

		Controls	Response box	anterior cingulate cortex and frontal brain regions
Wilson and Wallis	2013	48 University Students, (25 low and 23 high calorie restraint eaters)	Pseudo-randomised design Response Box	Whilst no statistically significant differences were found, participants demonstrated slow effect, with high restraint individuals taking longer to disengage from food and ego threat words.

Data collection techniques and design techniques for an emotional Stroop may vary making it difficult to ascertain which the most appropriate design is. For example, MacLoud (1995) argued that ideally voice responses should be used to record data as this is the automatic response rather than using a keyboard or response box. However Price (2011) suggests that vocal responses recorded via voice activated recording equipment are subject to both environment and participants factors may impact the collection of data and therefore alternative means of collection may need to be considered. This may include participants attempting to meet demand characteristics particularly when a design requires the presence of the researcher to monitor errors. Participants may feel additional pressures to perform well and this can create a confounding variable (Field, 2013). Additionally during an fMRI study, for example, noise levels would make it impossible to use voice activation equipment because of the substantial noise levels caused by the MRI. Further, utterances, including hesitation noises, such as 'uh', 'hmmm', 'huh', etc. and/or responding to errors, such as 'oops' will also alter how voice activated recorded responses are picked up making it difficult to disentangle the accurate response times from background noises and/or utterances . Price (2011) conducted research using both voice activated recording and response boxes to determine if response boxes would be a reliable alternative when voice recording is either unavailable or sub-optimal for data collection. Price (2011) obtained

similar results despite using response boxes during fMRI studies demonstrating that while they not be 'automatic' responses that are being captured, their issue result in data consistent with data collected using voice recording. Similarly, there is substantial

evidence to suggest that response boxes/keyboards and mouse response paradigms effectively capture the emotional Stroop effect (see Table 5-1).

Another substantial concern that needs to be considered is the best method of presenting the word trials. In a basic emotional Stroop, there are three options, random presentation, where the words are presented randomly, so aversive may be followed by neutral or positive or another aversive trial. This design is considered less than ideal as the slow effect (Phaf and Kan, 2007), the effect of greatest interest, may be lost due to the fact that one aversive stimuli could carry across several other trials, thus making it difficult to determine which type of aversive stimuli has the greatest impact (Phaf and Kan, 2007). The pseudo randomised design, is said to be fairly useful when working with clinical samples but still less reliable than the block design (Phaf and Kan, 2007). This is where there is a particular type of emotional stimuli is presented first and is then followed by a sequence of neutral trials (Fringers, et al. 2009). And finally, the classic block design may be employed; participants experience the trials via block of stimuli which is counterbalanced across participants. For example, a participant might experience block of positive, followed by neutral, followed by aversive emotionally valenced words or images. This design is said to be most ideal in otherwise healthy participants as it most effective at capturing the emotional Stroop effect in healthy participants according to Phaf and Kan (2007) who conducted a meta-analysis of emotional Stroop paradigms. The largest emotional Stroop effect sizes were achieved for the block design across 70 studies even when accounting for publishing bias.

As a block design has been recommended, in particular, for use with healthy participants is most effective at eliciting the Stroop effect and so that is the design that has been employed particularly it has also been suggested that a block design may mitigate the effects of age in an emotional Stroop study (Ashley and Siswick, 2009). To ensure that both a fast and slow effect has been captured an inter-trial stimulus has also been included to provide for a balanced design that does not emphasis or lose the fast effect to the slow effect, as recommended by Frings, et al. (2009) If factors such as sample utilised, including the age of the sample is controlled for, and the design and word usage is consistent, the emotional Stroop seems to be an effective tool for eliciting and measuring response to emotional stimuli (Phaf and Han, 2007; Price, 2011).

5.7 Self-report measures of emotion

Another effective method for capturing emotion for research purposes is via self-report. Olatunji, et al. (2007) have developed a screening tool that is intended to capture the multi-dimensional nature of disgust via self-report known as the Disgust Sensitivity Scale-Revised. This assessment measures disgust across a variety of disgust based domains from animal reminder, contamination, and core disgust. These domains including things like bodily fluids, odours, decay/death, illness/injury and the like. However, as there is concern about whether those with a preponderance of psychopathic traits will answer honestly, using self-report, in generally frowned upon, even for internal/intimate processes that cannot be measured directly despite the fact that there is evidence to suggest that even psychopathic individuals tend to answer as honestly as others in a research setting (Ray, et al. 2013).

The DS-R is a standardised self-report assessment used to measure disgust across three broad domains it has been validated with a number of samples and modified from the original DS assessment to ensure cross-cultural relevance and stability (Olatunjui, et al. 2009). At present there are very few validated disgust based assessments other than the

DS-R. Research into disgust sensitivity is growing very slowly when compared with exploration of other emotions making for very few self-report options; however, the DS-R has been used extensively in disgust based research (Haight, et al. 2010).

Currently, a substantial portion of research that explores psychopathy and emotion relies on functional neuroimaging studies and while they have enhanced the understanding of psychopathy, they are not readily accessible to all researchers, are expensive and costly to run, requiring expert interpretation and rely on small samples which limits how widely results can be generalised (Blair and Mitchell, 2009). If would be beneficial, then, to find a way that inexpensively explores neurocognitive function (or dysfunction) when exploring psychopathic traits in a variety of samples.

5.8 Neurocognitive theories of the emotional Stroop

Attentional control is believed to be mediated by the anterior cingulate cortex (ACC) (Banich, et al. 2009) Fear based research conducted by LeDoux (2003) suggest that the ACC acts as a cortical 'counterpart' to the amygdala and thalamic "fear circuitry" within the brain. This results in attentiveness to threat based stimuli including automatic response and an increase in arousal. Banich, et al. (2009) suggest that attention to emotional stimuli, particularly aversive stimuli will be selectively attended to more automatically than neutral or positive forms of stimuli due to the intrinsic threatening nature of the stimuli and a need to flee from a threat for survival in nature. According to Gyurak, et al. (2011) the dorsal/caudal region of the ACC was believed to be responsible for cognitive control over attention and the ventral-rostral regions of the ACC were responsible for affective subdivisions of control of attention. A review of current fear-based literature by Gyurak, et al. (2011) suggests that the dorsal/caudal

regions of the ACC are involved in the appraisal and expression of fear and the ventral-rostral region is responsible for acting in concert with the limbic regions to regular emotional responses. In clinical samples, particularly clinically anxious individuals there are evidence of reduced activation of rostral ACC suggesting an inability to disengage from the salience and emotionality of stimuli. Blair and Mitchell (2009) point out that psychopaths are believed to experience reduced responsiveness to aversive emotional stimuli and that this is a consequence of a paralimbic dysfunction including but not limited to dysfunction of the ACC. Essentially psychopathic individuals may perform better than healthy controls on tasks such as the emotional Stroop because they do not engage or become preoccupied the emotional valence of the stimuli thus exerting greater cognitive control (Blair and Mitchell, 2009). One means of activating ACC to explore cognitive and emotional control of attention is via the emotional Stroop paradigm (Gyurak, et al. 2011: Banich, et al. 2009; and Price, 2011).

5.9 Rationale and hypotheses

As psychopathic traits are said to be positively related to diminished experience of aversive emotion, a study has been conducted to explore the relationship between psychopathic traits in a healthy sample and measures of disgust sensitivity as measured by the emotional Stroop paradigm and the DS-R (Haight, et al. 2007) As this is an exploratory analysis of the potential relationship between disgust sensitivity and psychopathic traits, optimal research conditions, that is, conditions recommended in previous research for eliciting the emotional Stroop affect were utilised.

Hypothesis I: Participants who score higher on the PPI-R were experience less emotional interference of emotionally valenced stimuli performing better than lower scorers on the emotional Stroop task for both aggressive and disgust based stimuli. Positive stimuli will not be affected.

Hypothesis II : There will be a correlation between PPI-R scores and self-report of disgust sensitivity with individuals who score higher on the PPI-R responding differently than those who have lower PPI-R scores

5.10 Methodology

5.10.1 Design

A repeated measures design has been employed. A block style emotional Stroop was presented to participants using a laptop to present stimuli and a response box had been employed to enable participants to respond to on screen stimuli. There are four block consisting of neutral (20), positive (20), threat (20) (aggressive) and disgust (20) based words (See Appendix A) each repeated twice for a total of 160 trials; counterbalanced randomly across participants. The neutral, positive and threat based words have previously been utilised in research conducted by Smith and Waterman (2004) and Price (2011). This is to address issues raised by Price (2011) regarding inconsistencies in word usage across studies that result in confounding variables. Whilst this research paradigm is not identical to the work of Smith and Waterman (2004) or Price (2011) the words were suitable for these research aims. In addition 20 disgust based words were selected from the ANEW (University of Florida, 2010) affective word system. These words were selected to match the existing words in terms of word length and frequency, as well as ratings.

The blocks were counter-balanced across participants in a random order in an effort to mitigate practice effects (Field, 2013). Words appeared on the screen in Times New Roman font, size 48. Words were also pseudo-randomised within each block to ensure the same word did not appear concurrently. Each block was proceeded by (+) appearing on the screen for 500 milliseconds to aid the participant in orienting

themselves to the stimuli. Each word appeared on the screen until the participant responded. There was inter-trial interval of 500 milliseconds as suggested by Liu, et al. (2011).

5.10.1 Sample

A convenience sample participated in this study. Participation was voluntary, as per the terms of the BPS guidelines. Demographic details available in Table Using self-selection criteria, participants were asked not to participate if they were dyslexic or had other learning difficulties that may adversely impact reading words on a screen, did not speak English as their first language to mitigate effects of reading ability as recommended by Price (2011).

5.10.2 Apparatus

E:prime Version 2.0

Hewlett Packard Pavilion g6 Notebook PC; 15.6-inch display with a 720p (1366x768)

Psychology Software Tools Serial Response Box

Assessments: PPI-R (Lilienfeld and Widows, 2005), DS-R (Haight, et al. 2007) print copies

5.10.3 Procedure

Participants were provided informed consent. If participants agreed to participate they were provided copies of the PPI-R and DS-R to complete. Participants were asked to complete the questionnaires at least a week before completing the Stroop to avoid the possibility of priming responses, particularly for disgust based stimuli. Some identifying details were captured, but were encoded so that only the researcher was aware of the participants' responses. This was to enable the researcher to merge the questionnaire responses with the emotional Stroop results.

The data collection for the Stroop was conducted in University library cubicles, or at the participant's home or other convenient, quiet locations. There is evidence to suggest that this does not interfere with the collecting of data for the emotional Stroop effect (Phaf, et al. 2010) Participants received instructions for how to complete the Stroop tasks. They were advised they could use their dominant hand to respond via the response box. Participants first completed a standardised Stroop to aide them in orienting to the task and use of the response box. There were 20 Trials (10 congruent, 10 incongruent) colour words, the results of which were not included in the analysis.

5.11 Results

Participant's data was examined and errors were omitted from the data set prior to analysis. Participant's data was tested for normality (Appendix) and determined to be, for the most part, normally distributed, response times were measured at a ratio level and the DS-R has been treated as a plastic interval (Gavin, 2008) meeting the requirements to conduct parametric testing of the data as the inferential statistics that were utilised : One-Way ANOVA and Pearson's Correlation, withstand some violations of data assumptions (Field, 2013)

Table 5-2 Average Scores for PPI-R and DS-R

	Age	**PPI-R**	**DS-R**
Male (N=11)	36.55	59.45 (9.53)	44.09(8.45)
Female (N=29)	36.34	65.34 (8.70)	56.96 (10.69)

Table 5-3 Response Time Means and SD for emotional Stroop

	Neutral	Disgust	Aversive (Threat)	Positive
Low PPI-R (N=16)	921(43.16)	938(50.70)	982(34.47)	925(45.05)
Moderate PPI-R (N=12)	892(43.89)	920(45.52)	943(47.00)	895(42.51)
High PPI-R (N=12)	912(30.78)	939(25.48)	953(20.90)	913.(30.30)

The descriptive statistics (Table 5-3) show similar RT for the Neutral, Disgust, and Positive conditions, which would not suggest that individuals performed differently. Scores for the Aversive condition suggest that those with low PPI-R scores had greater response latencies than those who scored higher on the PPI-R. Curiously, those who scored High also had longer response latencies than those who scored moderately. This may be a consequence of individual differences. The results of the One-Way ANOVA comparing RT performance on the emotional Stroop suggest that Neutral (f=1.90, df, 2,37p>.05), Disgust (f:.811, df: 2, 37, p>.05), and Positive(f=1.90, df: 2,37, p>.05) were not statistically significant, suggesting no difference in how individuals performed regardless of their global psychopathy scores. However, there was a statistically significant difference in Aversive condition (f:4.72, df: 2,37, p<.05). Tukey's post hoc comparison suggests a small significant differences in how those who scored Low on the PPI-R performed compared with those who scored Moderately (p<.05) on the PPI-R.

Descriptive statistics of the response latency bias towards suggests incremental differences in the Disgust Bias condition across PPI-R scorers (Table 5-4), substantial bias towards the Aversive Bias, and negligible bias toward the Positive Bias. The

results of a One Way ANOVA for response bias toward a particular emotion suggest no statistically significant differences regardless of psychopathy scores with Disgust Bias (f:1.58, df: 2, 37, p>.05) Positive Bias (f: .233, df: 2, 37, p>.05) and Aversive Bias (f: 2.22, df: 2, 37, p>.05) all reporting non-significant differences.

Table 5-4 Response biases

	Disgust Bias	**Aversive Bias**	**Positive Bias**
Low PPI-R (N=16)	16 (25.37)	61 (25.48)	4 (19.15)
Moderate PPI-R (N=12)	28 (15.60)	51 (24.40	3 (-6)
High PPI-R (12)	27 (18.5)	41 (23.44)	.92 (2.99)

To determine if there is a positive relationship between self-report of disgust sensitivity as measured by the DS-R, a Pearson's correlation analysis has been completed. This is an admittedly crude measure as the RT and scores are not the same data type. This is purely exploratory to gauge if the DS-R and a response styles are similar. The Pearson's correlation (r.322, N=40, p<.05) suggest a weak positive correlation between self-report of disgust sensitivity and increased response latency for the Disgust condition of the emotional Stroop.

5.12 Discussion

The results of the emotional Stroop do not support the research hypothesis that individuals who score higher on a self-report measure of psychopathic traits will

experience statistically lower response latencies compared to their lower scoring counterparts. Whilst some of the means were in indicative of a reduced response latencies for some conditions this was not consistent across the aversive emotion-based stimuli as was expected. There was significant difference in how Moderate scorers performed when compared to Low PPI-R scorers, however, this difference, whilst statistically significant appears to be the consequence of individual differences in terms of emotional Stroop performance rather than a consequence of psychopathy scores particularly when considering the lack of statistically significant emotional bias scores.

While a crude measure of assessing validity of the DS-R, there was a weak positive correlation between increased response latencies and higher scores on the DS-R suggesting that the DS-R seems to capture self-reported experience of disgust sensitivity. More research using more comparable measures would be needed to confirm this however.

The results of the emotional Stroop are not entirely surprising. When considering the heterogeneous nature of psychopathy and consequently the variability in how traits may manifest in healthy individuals, even for those who score high on a measure of psychopathy, it is possible that the emotional deficits often described as prototypical of psychopathy are not prototypical. The more high-functioning an individual, perhaps the less they experience the attenuated emotional responses to aversive emotional stimuli. Conversely these individuals may be more adept at conforming to what is expected in terms of response, however, it is unlikely that would carry over to an emotional Stroop assessment, as well as the self-report assessment.

Further, the experience of disgust is said to neither be automatic, like fear, nor is it said to be as universal. Disgust is more subject to individual differences, and this may factor into whether or not individuals with psychopathy or a preponderance of

psychopathic traits have an attenuated experience or disgust or not. Society, culture and individual differences may have a far greater impact on the experience of disgust, ultimately. Also, because the disgust response is not automatic, the emotional Stroop may be less than ideal at capturing a response bias towards aversive stimuli. More research would need to be done with different samples using alternative means of eliciting disgust to determine what means are best for eliciting as 'automatic' as possible a disgust response in diverse samples, that does not violate ethics. Also it may be of particular interest to conduct research with individuals who are more inclined to violate social norms, or those who have engaged in particularly unpleasant crimes as they provide a better understanding of how psychopathy and disgust sensitivity may be related, as it may apply to some sub-types and not others.

There were numerous limitations to this study that must also be considered. This sample was a convenience sample of individuals available via the community thus limiting the generisability of the findings. The sample consisted of a majority of females, which may have skewed the results, as females experience aversive emotions differentially than males usually reporting higher than average disgust sensitivity than males. One curiosity of the sample is that females had higher PPI-R scores on average than males. This is atypical of psychopathy based research, however as the sample was largely female this may be a consequence having a majority female participant group.

A methodological limitation of the study that needs careful consideration is the use of the emotional Stroop. While research suggests its effective for capturing attention to emotion, in clinical samples, it may well be that because disgust is not an 'automatic' response, like other aversive emotions, the emotional Stroop paradigm may be less than ideal for use in disgust –based research with healthy individuals. Further, the word selection, while carefully selected using ANEW (University of Florida, 2010) to ensure word length, usage, and impact, selecting the most high impact words

available; it may be that disgust based words are not sufficient to elicit a disgust response in healthy individuals. It may be necessary to consider other means of eliciting disgust. Similarly, as this is the first known attempt at exploring disgust via emotional Stroop for use with individuals who scored high on psychopathy, the word list selected may have been less than appropriate. Further research testing different groups will be necessary to determine what the most effective word selections may elicit a disgust response.

Chapter 6. Exploring the theoretical relationship between BDSM, disgust sensitivity and psychopathic personality traits

Psychopathy and sexual deviance are often interlinked in clinical literature. More specifically a relationship between psychopathy and sadism are often suggested because of the traits shared by the two disorders including a lack of empathy, a willingness to inflict pain and violence on others and a seeming lack of guilt or remorse regarding such actions (Mokros, et al. 2011). There is very little research that examines the possible relationship between sadism and psychopathy, however. This is not for lack of trying on the part of the researchers, but rather because there is great difficulty in identifying precisely what constitutes sadistic behaviour much less what motivates it (Marshall and Kennedy, 2003; McLawsen, et al. 2008) Evidence suggests that the DSM definition of sexual sadism and masochism are both rather unclear; findings suggest that clinicians may vary in their interpretation of the definition and the criminal acts that may be under review (Marshall and Kennedy, 2003; McLawsen, et al. 2008). Furthermore, many seem to hold, at times, puritanical views of sadism of the consensual kind failing to recognise there is a difference between that which is consensual and that which is criminal (Langdridge and Barker, 2007). Some with the consensual sadomasochism community, for ease of identification the BDSM

community, have at times been so The medico, legal and psychological communities all seem to struggle with understanding what, precisely sadism is, both from the criminological as well as the consensual perspectives (Landridge and Barker, 2007).It is therefore necessary to examine the relationship between psychopathy, and sadomasochism; more specifically, the relationship between psychopathic traits in a subclinical samples and self-identification with the BDSM community. This will included an exploration of specific sexual activities that are considered to be sadomasochistic.

6.1 Sexual deviance

Purcell and Arrigo (2006) point out that defining so-called normal sexuality is a difficult endeavour. They indicate that society and cultural standards influence what is deemed 'normal' practice. They conclude that there are four main standards which influence that which is deemed sexually normal: Statistical standards, religious standards, cultural standards and subjective standards. Similarly, Laws and O'Donohue (1997) point out a fairly large grey area in understanding sexual practice, particularly deviant practices, as a mental disorder and what should be done about them. They point out that it is not entirely clear what qualifies as sexual deviance and if or why mental health professionals should be identifying 'sexual deviants' and treating them for their 'disorders'. They raise several issues including what should be included as deviant sexual practices; practices that are statistically rare, are considered deviant, but so is winning the lottery, very few people would view this has 'wrong' or worthy of treatment. They then consider whether or not a practice harms others. This can, likewise, be ambiguous because some practices, such as sadism, to a non-practitioner, at least, seem to harm others, but the practicing masochist may quite enjoy them. They similarly consider whether or not a practice may be deemed 'healthy' or 'unhealthy'. They also consider the evolutionary perspective, and whether or not

certain practices may deviate from this 'norm'. Certainly engaging in certain activities, such as fetishism override any biological imperative to procreate, for example, but this raises the issue of whether or not sex is merely intended for this purpose, why and who should be the arbiter in determining such matters. Purcell and Arrigo (2006), seem to differ, ever so slightly, in that they determine that while sexuality and sexual interests may fall on a continuum of mild to severe, that even paraphilic interests that are not harmful to others, such as fetishism, if 'severe', i.e. the individual can only obtain sexual gratification from their particular fetish, then this is problematic, even if the individual suffering from such is not personally bothered by such.

Gavin and Bent (2010) assert that deviance is a product of society. Deviance fluctuates, and what is considered acceptable in one setting, culture (or sub-culture) or at a particular time, may be considered taboo, forbidden, reprehensible and illegal elsewhere. Culture, society and religion seemingly influence to a great extent what is acceptable at a given time. This influence is pervasive; it determines things such as the appropriate age for marriage to what is appropriate sexual activity. According to Curra (2000, p. 4), 'difference is easily transformed into deviance, and deviance…into abnormality.' Most important to keep in mind "claims about normality or abnormality, health or illness, morality and immorality, conformity or deviance always reflect some form of centeredness because these claims are culturally bound and historically specific." However, he is quick to point out that while it is important to keep this in mind and to keep an open mind regarding the diversity of the human diversity, not to fall into the trap of blind acceptance of all diversity. That one can 'romanticize' diversity and this could make it difficult to understand social deviance.

As pointed out by Williams, et al. (2009) sexual deviance is difficult to define. It can range from compulsive masturbation to rape. Activities that range from, generally speaking, harmful to none when considering the former, to sexual violence when considering the latter. As a consequence the term deviant will not be used herein, rather atypical will be applied to sexual activities that are on a continuum of normal behaviour but tend to be statistically rare; specifically, consensual sadomasochism whereas those activities that are considered criminal will be referred to as deviant.

6.2 Consensual sadomasochism

Conceptualising and defining consensual sadomasochism is an arduous undertaking; particularly when considering that there are psychological, medical, legal and practitioner interpretations of what sadomasochism is (Langdridge and Barker 2007). When considering practitioner perspectives, for example, the individuals not only may identify with a particular gender or not, but they may also identify with particular practices and not others. The practices may be very diverse and idiosyncratic to the individual. Add to the mix varying understandings, definitions, interpretations, beliefs, assumptions, from the various perspectives mentioned, settling on one precise definition or terminology can be quite difficult. Langdridge and Barker (2007, p. 6) provide a suitably broad yet concise definition of consensual sadomasochism which "includes all sexual identities and practices involving pain play, bondage, dominance and submission and erotic power exchange." The practices are diverse across a number of domains with sex and sexuality seemingly playing a role in what activities some get up to while others do not.

While the research into BDSM is limited, Nordling, et al. (2006) found that sexual preference, in this case gay men, had different sexual appetites from their straight male counterparts in terms of the types of BDSM activities they would engage in. For

example gay men reported taking on hyper masculine roles while straight men reported being more interested in humiliation, including cross dressing. Historically, there had also been a more puritanical view of women's roles in BDSM, with the assumption being that women would only engage in BDSM when being paid as part of prostitution and would otherwise have no interest in such, at least according to Bancroft (1995), however, it is generally accepted that women as well as men, engage in BDSM to varying degrees (Moser, 2006). However, how and why people engage in BDSM is unknown. Why someone may derive pleasure from pain, humiliation, role-playing and other activities is not well-understood but it is believed by some to be a part of healthy sexual expression (Moser, 2006).There are a variety of activities that are considered to be part and parcel of BDSM. This can range from light to elaborate bondage through to "water sports" (sexual activities involving urine) on to paddling, whipping, flogging, and a host of activities in between(Landridge and Barker, 2007). It is important to keep in mind that many people may engage in a range of BDSM activities, but never identify with the sub-culture itself. Also important to keep in mind, that just because someone engages in some activities or identifies themselves with certain aspects of BDSM they do not necessarily identify with all aspects of BDSM (Williams, 2006).

6.3 Non-consensual sadomasochism

According to the DSM-TR-IV (APA, 2000) Sexual Masochism is defined as 'acts (real, not simulated) of being humiliated, beaten, bound or otherwise made to suffer'; including the presence of rape fantasies. Sexual Sadism, 'involves acts (real, not simulated) in which an individual derives sexual pleasure from the pain and suffering

of the victim'. These two disorders are presented as seemingly mutually exclusive by the DSM-TR-IV (APA, 2000). It is unclear if this is intentional, however, several other authors have suggested that they are not mutually exclusive and that individuals who enjoy sadism, may likewise enjoy engaging in masochism and vice versa (Hucker, 1997). There is acknowledgement that some individuals are bothered by their fantasies and behaviour. There is also an extensive list of activities that are considered to be either masochistic, including: the use of restraints, blindfolding, paddling/spanking, whipping, beating, electric shocks, cutting, infibulations, humiliation, including being defecated or urinated on. Sadism includes inflicting many of these acts on a victim, but also burning, rape, stabbing, strangulation, torture and mutilation. It also suggested that severe sexual sadism, especially combined with co-morbid personality disorders may lead the sexual sadist to seriously injure or kill their victims (Healey, et al. 2012). In fact, several authors associate sexual sadism (see Kirsch and Becker, 2007; Healey, et al. 2012) with some of the most severe forms of crime, particularly serial rape and murder(Geberth and Turco, no date ; Myers, et al. 2008) . Polashek (2003) likewise indicates that for some types of rapists, a diagnosis of sexual sadism is not uncommon. A similar sentiment was more recently echoed by Healey, et al. (2012) Healey, et al. (2012) indicates that there are specific crime scene indicators that can delineate a non-sadistic rapist from a sadistic rapist. These indicators include premeditation, humiliation, torture, physical restraints, and the use of excessive force against the victim.

Sexual sadism and masochism, are hardly new practices. The earliest recognition of either as disorders is attributed to Krafft-Ebing (Allgeier, et al.; 1995; Hucker, 1997; Langdridge, et al. 2007) who suggested that sadists have "an innate desire to humiliate,

hurt, wound or even destroy others…to create sexual pleasure for one's self."(1887, p. 45) He added that the objects of such pain may include children and animals.

As pointed out by Allgeier and Allgeier (1995) paraphilic interests can be a matter of perspective. What is considered deviant at one time, or in one culture may be permitted even typical in another. They categorized Sexual Sadism and Masochism as non-invasive consensual paraphilias. There are acknowledgements that there is a difference between predatory sexual sadism and consensual (Hucker, 1997). Non-consensual sadism, in particular, is frequently reported as being co-morbid with several other paraphilias including necrophilia, vampirism, frottage, exhibitionism and paedophilia (Hucker, 1997). Further, it is often suggested that sadism is a prerequisite to serious offenses, including lust murder. It is suggested that some lust murderers may have initially engaged in more 'minor' acts of sexual sadism, but due to habituation sought out more extreme activities to satisfy themselves (Hucker, 1997: Kirsch and Becker, 2007; Frances and Wallert, 2012).

There are some general criticisms of paraphilias as mental disorders, as defined by the DSM-IV (1994). First, as Polachek (2003), points out. To be a disorder, the fantasies, urges, and behaviour have to cause distress to the individual engaged in them. And secondly, for many, their urges, fantasies and behaviours do not impairments in normal 'functioning'. He also points out that, similarly to Allgeier and Allgeier (1995) not all paraphilias are criminal, or problematic. Finally, he points out that while the criteria for the disorders have changed over editions, it is unclear what the basis for these changes might be; according to Polaschek (2003), they do not appear to be based on empirical research.

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6.4 Consensual versus non-consensual sadomasochism

Currently, there seems a greater willingness to accept that sadomasochistic sexuality is a dimensional construct, not unlike psychopathy in terms of the dimensionality. Behaviours that range from consensual, i.e. activities engaged in by those in the BDSM community to non-consensual sexual violence engaged in by offenders against the will of others. Denman (2004) describes sadomasochism as a collection of activities that involve 'mental or physical pain' as well as 'physical achievement'. Endurance is probably an under-considered reason why sadomasochism may be popular. Not to mention strength and flexibility should also be considered.

Dietz (1990) cited by Denman (2004 pp. 204) offers the following description for how criminal and consensual sadomasochists differ, "Criminal sexual sadists secure unwilling partners, force sexual acts on victims, have an unemotional detached demeanour, use torture and have no tendency to switch and take the role of victim." The last statement is not entirely true as several criminal sadists, such as the Dennis Raider and Albert Fish were said to engage in masochist acts, as well as sadistic activities. In fact, Dennis Raider was known to dress in women's clothing and emulate some of his victims. Post-mortem examination of Fish found that he had inserted several long needle-like 'rods' into his pelvic region that would stab him whenever he sat.

Thompson (1994) also cited by Denman explains, "in contrast to criminal sexual sadists, SM devotees go to great lengths to ensure the physical safety of their partners." "Including employing various techniques, language, rules, and beliefs to reduce harm." (p 208) It was also pointed out that participants more often have 'vanilla sex' rather than engaging in BDSM, and that these activities were supplemental to a

generally healthy sexual lifestyle. This is a sentiment that was echoed by Meloy (1997) who had written a paper about the perceived relationship between psychopathy and sadism. He acknowledged that there is a difference between the consensual BDSM and non-consensual sadism, however, he still referred to it as abnormal. He also pointed out that up until that time he could find only 4 studies that explored BDSM. Unfortunately this is a lingering problem in terms of better understanding the varied nature of sexuality, including BDSM. More recently, however, there does seem to be greater sensitivity towards those who engage in BDSM, particularly by clinicians and others in the field of psychology and medicine (see Cross and Matheson, 2006; Williams, 2009).

Sadism, as a disorder appears to be at one extreme of the spectrum of sexual behaviours and denotes a maladaptive form of sexuality including the infliction of harm, both physical and psychological on an unwilling victim, whereas consensual sadomasochism differs in that that the infliction of harm, be it physical or psychological is controlled, consented to and requested. Understanding how these constructs differ, as well as overlap and what relationship they may have with psychopathy and psychopathic traits could provide better understanding of how sexual behaviour may vary and why some individuals engage in behaviour that is criminal and others do not.

6.5 Psychopathy, Sadism and BDSM

In Cleckley's (1946; 1976) editions of the "The Mask of Sanity" he indicated that psychopaths were seemed to be promiscuous and indiscriminate in terms of sexual partners. Hare (1993) went further to suggest that psychopaths did not seem capable of meaningful relationship, rather they used others for personal gain, again mentioning

their promiscuity and parasitic lifestyle. More recent research that explores psychopathy and intimate relationships suggests that individuals who scored higher on traits associated with primary psychopathy reported positive relationships and intimacy, where as those who scored higher on traits associated with secondary psychopathy experienced lower life satisfaction and problems with intimacy (Ali and Chamorro-Premuzic, 2009) . There is otherwise comparatively little research into how non-offending psychopaths experience intimacy, from relationships through to sexual practices. Currently, what is understood about psychopathy and sadism has been gleaned from literature based upon violent sexual offenders with a co-morbid diagnosis of psychopathy and sexual sadism (Kirsch and Becker, 2007).

6.6 The Possible relationship between disgust sensitivity, psychopathy and BDSM

The relationship between sexuality and disgust sensitivity is an interesting one. Disgust can be triggered by a range of stimuli: corpses, spoilt food, bodily fluids, politicians, faeces shaped chocolate, various sexual practices, (Olatunjui, Moretz et al. 2009) and immorality (Glenn, et al. 2009). Disgust is said to be driven by a host of factors from a desire to avoid contamination for survival purposes through to social and cultural factors that vary from one culture to the next (Olatunjui, et al. 2009). Sex differences are believed to play a role in disgust sensitivity with women often reporting higher levels of disgust sensitivity then males. Individual differences also play a role in what people find disgusting (Mataix-Cols, et al. 2008). As part of BDSM sex play, blood, urine and faeces may be incorporated in varying ways, ranging from blood –letting and drinking through to being urinated or defecated, etc. It would be reasonable to assume that these individuals may have a modified response to disgust, at least in some of its forms (Williams, 2009). However at present there is simply not

enough known about the relationship between disgust sensitivity and BDSM to draw such an inference. Furthermore, there is simply not enough known about the complex emotion disgust to draw inferences about why individuals experiences of the emotion may vary. Certain features of disgust, such as core disgust are believed to indirectly modify what is considered disgusting sexually. Research conducted by Olatunjui, et al. (2008) found there was an indirect relationship between core disgust and negative attitudes towards homosexuality which was also mediated by conservative attitudes towards sex, in general.

In terms of theoretical assumption, at least, it is believed that there is a relationship between BDSM and psychopathy which may, in part, be mediated by attenuated disgust sensitivity. This assumption seems to be drawn from relationships suspected between those who engage in sadism as part of a crime who are assumed to be psychopathic due to the perceived lack of empathy and morality experienced by both groups. However, how psychopathy ties to consensual BDSM which is consensual form of varied sexual play) is unclear (Williams, 2009).

At present there is scant research that has examined the role psychopathy or disgust sensitivity might play in terms of BDSM. One study conducted by Williams, et al. (2009) found a positive relationship between what they referred to as deviant fantasy and psychopathy with those who scored more highly on measures of psychopathy enacting more of the atypical fantasies than those with lower scores. A number of fantasy items included items associated with BDSM activities such as fetishism, sadism, masochism, bondage and sexual assault fantasies. However the fantasies also involved activities such as paedophilia, exhibitionism and frotteurism, which were generally criminal in nature. disentangle deviant fantasy from atypical, whilst keeping in mind that while unsavoury, are harmless and not suggestive of criminal

propensities (Wilson 2010). The explanation offered was that the callous and impulsive nature of psychopaths makes them more likely to enact their deviant fantasies. Another study Schienle, et al. (2005) that explored the neurological underpinnings of disgust in BDSM and non-BDSM participants found slightly different brain activations in the BDSM group that rated BDSM images as erotic compared to those who were not interested in BDSM who found them disgusting.

Theorists argue, however that disgust is likely an emotion involved in regulating sexual behaviour (Blair, 2007). In part, because disgust seems to play a role in what is considered moral/amoral (Borg, et al. 2008). How disgust may regulate or mediate what is appropriate sexual behaviour is currently unclear. Olatunjui, et al. (2008) suggests that with regards to sexuality that is atypical, such as homosexuality, disgust may be elicited because of the perception of gays being an extreme out group that certain types of sex are unnatural, and also concerns regarding contamination via bodily fluids. All of the above could theoretically apply to BDSM activities as well. The BDSM community has often been considered an extreme out group, many engage in activities that are atypical sexually and many engage in activities that involve bodily fluids such as blood, semen, faeces and urine which could result in contamination of some kind.

As psychopaths are believed to have attenuated experiences of aversive emotion (Del Gaizo and Falkenback, 2008), attenuated morality (Glenn, et al. 2009), emotional empathy (Blair, 2008), and seemingly engage in more atypical fantasy and behaviour than others, therefore they are more likely to engage in BDSM (Williams, et al. 2009). Some of this seems contradictory to what the BDSM proponents argue is necessary for safe play. Individuals are meant to be acutely sensitive to the wants and needs of the individual they are interacting with and while humiliating and or inflicting some sort of controlled pain on someone may seem strange or pathological to the uninitiated

these acts are well thought out, planned and orchestrated with safety of all participants being of the greatest concern.

Rationale

The current study examines the possible relationship between psychopathic traits potential attenuated disgust sensitivity, and BDSM practices. There are three research hypotheses under investigation for this study.

Hypothesis I: There will be a strong positive statistically significant correlation between PPI-R scores and self-reported BDSM activities.

Hypothesis II There will be a strong negative statistically significant correlation between PPI-R scores and disgust sensitivity scores as measured by the DS-R.

Hypothesis III: there will be a statistically significant difference between low, moderate and high PPI-R scorers and their self-report of disgust sensitivity and BDSM activity.

6.7 Method

6.7.1 Participants

Participants were obtained via self-selection snowball methodology as the self-reported BDSM community proved quite insular and resistant to participation. Participants were asked to exclude themselves if they had been victims of any sexually based offenses this as done in effort to reduce the risk of psychological harm coming to participants. There a total of 48 participants (33 Female, 15 Male with a Mean Age: 39)

6.7.2 Apparatus:

PPI-R (Lilienfeld and Widows, 2005)

DS-R (Haidt, et al. 2007)

Nordling Sexual Activities Checklist (Nordling, et al. 2006)

6.7.3 Procedure:

Potential participants were vetted via contact with a member of the BDSM community who provided copies of the links and password to the study to participants who might be interested in completing the study. Participants were provided with a virtual informed consent upon accessing the study online. If interested in completing the study they were prompted to tick boxes confirming they understood the nature and parameters of the study, that there data would be treated as confidential and anonymous and that they could withdraw their data at any time or refuse to answer questions they did not wish to. Participants than completed the PPI-R, DS-R and the Sexual Activity Checklist. This was followed by debriefing where participants were provided details of the study, contact information for the researcher and again reminded of their right to withdraw from the study.

The assessments were scored according to the authors instructions, with the exception of Nordling's Sexual Activities Checklist and any participants who had responded inconsistently via the PPI-R were removed from the data set.

6.8 Results

Prior to inferential statistical analysis the data was tested for normal distribution using the Shapiro-Wilk Test of Normality. The data was normally distributed, exhibited homogeneity of variance and measured at a plastic interval level, therefore parametric testing was deemed appropriate. A series of Pearson's correlations were conducted to examine the assumptions about the relationship between psychopathy, BDSM activity, and disgust sensitivity. There was

Table 6-1 PPI-R, BDSM Activity and DS-R Means and SD

	Age	PPI-R	BDSM Activity	DS-R

Male (N=15)	40.73	62.25 (10.33)	25.25(5.56)	52.67(12.75)
Female(N=33)	37.6	67.5 (6.55)	26.8(6.7)	59.39(13.07)

not a statistically significant positive correlation between psychopathy as measured by the PPI-

R and BDSM activity. (r: .02, p: >.05, N: 48) The results suggest that there was no correlation between psychopathic traits and engagement with BDSM activities. Similarly there was no statistically significant negative correlation between psychopathic traits and disgust sensitivity for this sample. (r: .08, p: >.05, N: 48) However, there was a weak, negative correlation between disgust sensitivity and BDSM activity (r: -.13, p: >.05, N: 48). The correlation was not statistically significant. As Benning, et al. (2005) suggests that when statistically possible the two-factor structure of psychopathic traits should be explored independently Pearson's correlations were conducted to explore the two factor structure of psychopathic traits with regards to both disgust sensitivity and BDSM activities. There was not a significant relationship between PPI-R1 and DS-R scores: (r: .06, p>.05, N=48) nor was there a correlation between PPI-R2 and DS-R scores (r: .09, p>.05, N=48). Further there was no correlation between PPI-R1 and BDSM activities (r:.13, p>.05, N=48) or PPI-2 and BDSM activities (r:14, p>.05, N=48).

A One Way ANOVA was also conducted to determine if there was a statistically significant difference across group members who obtained Low (>45-59), Moderate (60-69) and High (70+) scores on the PPI-R for self-report of BDSM Activity and Disgust Sensitivity.

Table 6-2 PPI-R and Disgusts Means and SD

PPI-R Rank	N	BDSM Mean	SD	Disgust Mean	SD
Low (>45-59)	11	25.27	5.67	56.72	12.89
Moderate(60-69)	25	25.88	7.81	57.24	13.57
High (70+)	12	26.33	3.79	56.81	

The results of the One Way ANOVA to determine if there was a difference in the level of BDSM Activity across the low, moderate and high scorers was not statistically significant (f=713, df: 2, 45, p>.05) Nor was there a statistically significant difference in self-report levels of Disgust Sensitivity for the low, moderate or high scorers on the PPI-R (f: .023, df: 2, 45, p>.05)

6.9 Discussion:

Contrary to theoretical assumption, there was not a positive correlation between BDSM activity and psychopathic trait scores as measured by the PPI-R including a separate exploration of PPI-1 and PPI-2 factors. This research does not provide evidence for a relationship between consensual sadomasochism and psychopathic traits. Similarly there was not a negative correlation between psychopathy and disgust sensitivity for this participant sample suggesting that unlike other aversive emotions, disgust may not be attenuated in individuals who score higher on measures of psychopathic traits despite. These results are similar to that of the previously study that suggest that psychopathic traits are unrelated to disgust sensitivity and that disgust may not be experienced in an attenuated way by individuals who have a preponderance of psychopathic traits. A limitation of measuring disgust via the DS-R is that the aspects of disgust sensitivity measured by the DS-R including core disgust and contamination do not have a direct relationship between BDSM activities. An examination within the

group of self-reported BDSM practitioner's there was not a statistically significant difference in reporting of BDSM activity regardless of whether the individuals were low, moderate or high scorers on the PPI-R. Similarly, disgust sensitivity was not differentially experienced across the group, regardless of the PPI-R scores. This is inconsistent with theory that suggests that those that demonstrate psychopathic traits are more likely to demonstrate co-morbid sadism. Again, this suggests that the lack of empathy and callousness assumed to be necessary to engage in sadism does not carry over to BDSM where the activities are consensual and empathy and caring are said to be essential to ensure a safe and pleasant experience for the practitioners.

This research is novel as it explores a range of sexual activities unique to the BDSM community and the perceived relationships these constructs are believed to have with psychopathy and disgust sensitivity which until now has received little consideration. Furthermore, this research examines whether or not disgust sensitivity as measured by the DS-R may be involved in moderating sexual conduct as theorists argue disgust moderates sexual behaviour. At present the relationship seems tenuous. Despite previous research that suggested that facets of disgust such as core disgust and contamination did moderate perception of homosexuality which in theory may have shared features with BDSM, this did not appear to be the case, in terms of BDSM practitioners, as disgust sensitivity was expected to be negatively related to BDSM, but in fact, was found to not have a statistically significant relationship. What makes this research particularly unique is the large proportion of female respondents, something not typically reported in BDSM related research. Currently, the majority of research explores male BDSM participants almost exclusively. This research also addresses some assumptions about BDSM, including those that suggest that women that do participate do so reluctantly or because they are paid to as part of prostitution and not

because they themselves enjoy these activities. Examining the differences in female BDSM practitioner's disgust sensitivity levels when compared with females who do not engage in such may also prove may also prove useful to determine if females BDSM practitioners have attenuated experience of disgust when compared to non-practitioners as women tend to report higher levels of disgust sensitivity, in general.

There were some significant limitations to this study that must be considered. The domains of disgust as measured by the DS-R to measure disgust sensitivity as it applies to sexual behaviour may be less than ideal, however, because the DS-R measures how someone may respond to bodily fluids, contamination, core and animal reminder disgust, which have been suggested may underscore attitudes towards sexuality as well, it was utilised for the purposes of this research. For example, in some BDSM play, bodily fluids including blood, urine and faeces figure prominently, therefore this DS-R may, depending on individual differences may be a good gauge of disgust sensitivity as it applies to sexual conduct for some respondents. Ultimately, a tool that examines sexual attitudes in terms of what is viewed has disgusting may prove more useful as it relates to a variety of sexual practices, not just BDSM. Future research to develop such an assessment of disgust related to sexual practices would be very useful. Also, exploring the relationship between disgust, morality and psychopathic traits may shed light on the relationship disgust and morality share in term of psychopathy there is theory and some research that suggests a relationship between attenuated morality and psychopathy and that this too may lead to atypical sexual practices. How morality figures in relation to BDSM may also prove useful. Snowball sampling was an essential strategy for gaining access to the BDSM community due to an initial lack of cooperation on the part of the BDSM community. It also must be also considered that socially desirable responding may have play a role in response sets for the PPI-R as respondents may have felt an obligation to respond in socially desirable ways to ensure that the BDSM community is portrayed in a positive

light. First, the range of scores was from the statistical mean to quite high end of clinical significance and reviews of the virtuous and deviant responding scales did not indicate that the majority of participants were attempting to appear in any way more socially desirable than other participants had in this research. Furthermore, as Llilienfeld and Widows (2005) have argued, some may appear to be responding in either a virtuous or deviant way due to their positive or negative impression management, as any other respondents might, regardless of their sexual interests and only those who are inconsistent in responses should be included in research.

Areas of future exploration including examining the role of pain, BDSM and psychopathy may be extremely useful to research. Currently the role pain plays in sexual play is poorly understood. How personality and individual differences determine what role pain plays in BDSM would be of particular interest as pain is also considered aversive and its relationship to psychopathy has also not been explored in depth. Ultimately, there is great deal more that needs to be done in terms of understanding the diverse sexuality of BDSM practitioners. Gaining access and trust is essential for successful research studies, and ensuring that participants are treated in a fair and respectful way is a must.

One final issue with this and all research that explores sensitive issues such as sexual activities and practices is that participants may be reluctant to share their interests and points of view with researchers for fear of reprisal or judgment; providing a safe and non-judgmental environment for participants to complete this research, such as the use of anonymous responding via the internet proved particularly useful. Participants seemed eager to share their sexual preferences in terms of the diversity of responses received.

Chapter 7. Exploring the relationship between BDSM fantasy, psychopathic personality traits and disgust sensitivity.

Psychopathy is often interlinked with atypical and deviant sexual practice and fantasy. However this relationship has not been explored extensively to determine if it is more than a theoretical assumption. Sexual attitudes and behaviours are believed to be moulded by society, culture, and individual differences with specific emotional substrates underscoring these proclivities. Disgust sensitivity is believed to moderate a host of behaviours including avoidant behaviours for things that are considered corrupt or contagious, as well as disgust towards things that are considered morally reprehensible including particular sexual practices such as incest or bestiality. Psychopathy is often described as a disorder where the individuals experience impoverished levels of emotion, particularly for aversive emotions, so it would seem necessary to explore the interaction between psychopathy, disgust sensitivity and atypical sexual fantasy in sub-clinical samples as there is an implied relationship between these constructs. As with the previous chapter that explored BDSM behaviour and its relationship with psychopathy and disgust sensitivity, this chapter is intended to examine the relationship between atypical sexual fantasy, in the form of BDSM fantasy as it may be related to psychopathy and disgust sensitivity. Additionally, a comparison between of PPI-R and DS-R scores for self-identified BDSM practitioners

and those who do not participate in such activities but may fantasise about such will be examined to determine if there are any statistically significant differences in these groups as theory suggests that those that engage in atypical sexual practices would be more prone to psychopathic traits than those who do not.

7.1 Sexual fantasy

Sexual fantasy encompasses a variety of thoughts, memories and experiences that an individual may access for pleasure and arousal regardless of how immoral, dangerous, explicit, or even impossible the fantasy may be (Carlstedt, et al. 2011). Carlstedt, et al. (2011) suggest that sexual fantasy seems to be moderated not only by sex/gender, but also individual differences, personality type, and emotional states may impact the nature, frequency and type of sexual fantasies reported. Research into sexual fantasy is hampered by the very notion of what is reported in relation to what has been thought. What participants are willing and able to report, compared to their actual fantasies may vary, particularly when fantasies may include subject matter that is considered to not be socially or culturally acceptable (Wilson, 2010). Hence, fantasies are entirely private, and as a consequence, cannot be readily accessed and therefore require self-report on the part of willing participants (Sheldon and Howitt, 2008).

Wilson (2010) developed a tool to try and measure sex fantasy from an evolutionary perspective to better understand the nature of fantasy, in particular, sex and gender differences. As Wilson (2010) points out, sexual fantasy seems to be more about satisfying basic instincts, rather than public opinion or behaviour on the part of the person engaging in the fantasy. Male and female sex fantasies tend to vary, with women's fantasies containing more intimate and loving themes while males tend towards more anonymous and pornographic fantasies (Wilson, 2010). Though, it also must be acknowledged that culture and society may also impact the nature and type of

sexual fantasies experienced by individuals (APA, 2000). The role sexual fantasy plays is not entirely understood. It may provide an outlet in lieu of a particular sexual experience, to facilitate or enhance masturbation or sex, etc. in healthy populations(). Interestingly it is generally accepted that a lack of sexual fantasy is considered to be indicative of disorder as outlined by the American Psychological Association(2000) (see Sexual Desire Disorders, pp. 539). Sexual fantasy is considered part of 'normal', healthy sexual experience. Despite this assumption that sexual fantasy is a typical of normal sexual health, sexual fantasy can also be indicative of sexual maladaptive tendencies (Sheldon and Howitt, 2008). Particularly when the sexual fantasies are considered deviant and the individual engaging in such is a known offender (Sheldon and Howitt, 2008). What leads to confusion, however, is that the non-offender may engage in the same types of fantasies as an offender, including fantasies of a paedophilic, rape, incest, and/or bestiality focus(). What is not currently understood is why one individual will act on those fantasies and others never do. Some suggest that personality, in particular psychopathic personality traits mediate sexual fantasies in both healthy and offending populations with individuals who have a preponderance of psychopathic traits reporting more atypical sexual fantasies which they are more prone to act upon(). There are a number of problems with these assumptions, however. First, there is little research that has looked at the relationship between psychopathy and fantasy, particularly in subclinical samples and secondly it would appear that value judgments are being placed on the type of fantasies considered 'normal' and abnormal. While some fantasies are considered perfectly acceptable and those that fall outside the statistical norm (as far as the researchers are able to assess) or those that may be viewed as morally reprehensible being considered deviant and therefore the assumption is those that engage in atypical fantasies must in some way be disordered or at the very least troubled and somehow similar to offending counterparts who not only have similar fantasies but also act upon them. Again, it would seem that because

of a lack of understanding, not only of fantasy but also the differences in sexual practices such as BDSM and how they differ from Sadism that occurs as part of offending may provide the impetus for this erroneous relationship. The greater issue seems to be determining what is acceptable in terms of behaviour and fantasy. There is an expressed concern that those who engage in atypical and/or deviant sexual fantasy are possibly more likely to engage in atypical/deviant behaviour, but the mechanism behind fantasy and subsequent behaviour are unknown. Also, there is a substantial problem in disentangling what is socially, morally, and legally acceptable sexual behaviour and what is not. Even within the literature, the term deviant is often used to describe that which is criminal, in terms of fantasy/behaviour and that which is statistical rare but not criminal in nature, which likely contributes to confusion. Herein, deviant will refer to the criminal, whereas atypical, will refer to that which is legal, though statistically rare. This relationship, like the theorised relationship between psychopathy and BDSM activity does not have an extensive amount of research to draw upon to support this assumption and so an examination of the atypical sexual fantasy and offending behaviour will first be explored to try to facilitate understanding of the role of fantasy in behaviour and what might mediate it.

7.2 Atypical sexual fantasy and offending behaviour

Despite the concerns over atypical sexual fantasy, It is generally understood that atypical sexual fantasy does not necessarily lead to atypical behaviour (Mangiglio, 2010). Similarly, researchers and theorists are now more inclined to accept that sexual fantasies and behaviours that may be considered atypical are not necessarily wrong, immoral, or criminal(). Rather sexuality including BDSM, be it fantasy or practice, is merely a dimensional construct on a continuum of behaviours that vary statistically, culturally and sub-culturally (Moser, 2006). There remains a caveat that atypical fantasies, particularly fantasies that are considered deviant, e.g. paedophilic fantasy, will lead to offending behaviour precisely because these fantasies may facilitate such

behaviour, including conditioning and promoting further deviant behaviour(Sheldon and Howitt, 2008). Furthermore, theorists suggest that certain personality types or those that exhibit certain traits associated with certain personality types/disorders may be more prone to atypical fantasies and as a consequence be more inclined toward deviant and or criminal acts than others (Geberth and Turco, no date).

According to Williams, et al., (2009) it is essential that atypical fantasy be better understood from medico legal and psychological standpoints. Court cases have been decided, often with the guilt of an individual hinging upon their so called "deviant" fantasies as evidence that they perpetrated a particularly heinous crime. However, atypical fantasy, even if it is paedophilic in nature should not be considered evidence that someone is indeed a paedophile. Currently, there is little evidence to explain the relationship between atypical or deviant sexual fantasy and practice(). Following the lead of Williams, et al. (2009) the definition used here to denote atypical would range from acts that are non-aggressive through to rape fantasy. It is important to consider, however, that rape fantasy often consists of those who fantasise about being the victim as well as those that fantasize about being the aggressor (Carlstedt, et al. 2011). Not all atypical sexual fantasy implies that individuals wish to be aggressive against others, in many cases individuals fantasise about assuming the role of a victim, as well. This seems consistent with fantasy of a BDSM nature where someone may be either the dominant or submissive (or a combination therein). Of particular interest, however, is that Williams, et al. (2009) suggest that there is a relationship between atypical fantasy and personality, in particular, personality traits associated with psychopathy. The assumption being that atypical fantasy leads to atypical behaviour, particularly in those who exhibit a host of psychopathic traits. The reasons for this are quite similar to those that apply to psychopathy and atypical sexual behaviours. These individuals, due to their callous, cold-hearted, self-centred nature will be more inclined toward atypical fantasy and practice as self-gratification and cruelty are considered fairly

standard among individuals who demonstrate a preponderance of psychopathic traits, at least in offending populations().

Unfortunately, there is little empirical evidence that explores the relationship between the sexual fantasies of offenders and their offending behaviour and how their personality type or disorder may factor into this(). Nor is there research that examines why non-offenders may engage in 'deviant' fantasies but never act on such(Sheldon and Howitt, 2008). It becomes difficult to explain the presence of atypical fantasy, including sexual fantasy that involves criminal activity, such as rape, as engaged in by non-offenders who never go on to offend. Similarly, while there is evidence to suggest a relationship between sadistic sexual fantasy and offending behaviour, there is very little research that explores sadistic fantasy in individuals who do not commit crime (Gray, et al., 2003). What little research that does exist suggests that non-offenders, both male and female engage in sexually sadistic fantasy that ranges from binding/bondage through to humiliation and rape fantasies (Gray, et al., 2003). with regards to both offenders and non-offenders atypical and/or deviant fantasy is not necessarily a blue print for behaviour; though in offenders, the mechanism behind fantasy and its relationship to behaviour is not currently understood though it is accepted that as much as 92% report deviant sexual fantasies (Sheldon and Howitt, 2008). In offenders the role of fantasy can vary from a form of rehearsal, facilitation of sexual arousal, or because fantasy and offending have a shared common origin (Sheldon and Howitt, 2008). What is thought to mediate the behaviour of many sexual offenders at least many report increases in deviant fantasy and offending seemingly in response to bouts of loneliness, depression and/or low self-esteem. It is believed that a combination of factors including low mood, cognitive distortions and masturbatory fantasies reinforce engagement in deviant sexual behaviours. However, non-offenders

will also be prone to loneliness, depression, and low self-esteem (Sheldon and Howitt, 2008) and do not go on to offend so it may very well be likely that the prominent role fantasy is assumed to play in subsequent behaviour is not as important as other factors; one factor of apparent concern, however, is the relationship between being psychopathy and/or psychopathic traits and their relationship to deviant fantasy and potentially subsequent behaviour that requires investigation.

7.3 BDSM fantasy and psychopathy

As mentioned in previous chapters, sadism seems to be heterogeneous construct and BDSM may be part of a spectrum of activities and behaviours that range from consensual through to criminal. The previous chapter explored the relationship between BDSM activity and psychopathic traits and the findings suggest that there is no relationship between these two constructs. This is more consistent with what BDSM practitioners suggest; that to be in a consensual BDSM relationship requires empathy, caring and thoughtfulness of one's partner, their wants and desires(Landridge and Barker, 2007).

As the relationship between fantasy and behaviour is unclear, an examination of BDSM fantasy and the assumed relationship it may have with psychopathic traits has been examined. This is necessary to not only understand fantasy as it applies to those who engage in atypical sexual fantasy and practice but those who engage in atypical fantasy but not the behaviours. This may help to inform what is understood about sexual fantasy in general, but may provide insight into sexual fantasy as it applies to offenders, as well. It should be kept in mind that there may be a segment of the population that acknowledge these fantasies but may be unaware of the sub-culture available to engage in such. For others, perhaps the fantasy alone is sufficient to provide sexual release. Understanding what mediates and facilitates atypical sexual

fantasy in terms of personality and emotion may provide greater understanding of sexual fantasy, in general. Not only that, but understanding the underpinnings of BDSM and how it differs from Sadism as a disorder is essential to understanding the spectrum of sexuality from the atypical to the truly deviant, as well.

7.4 The possible role of disgust sensitivity and sexual fantasy

Disgust, as mentioned in previous chapters, is a dimensional construct and one of the six basic emotions that is elicited by a wide variety of stimuli, ranging from animal reminder disgust through to stimuli that may be deemed as morally reprehensible(). It is a complex phenomenon and under-researched, at present but the reasons for this are not entirely clear (Power and Dalgaleish, 2008). It is believed that disgust has some role in moderating sexual behaviours, this is also not entirely clear but early theories suggest that those that engage in atypical sexual practices or those that are viewed as different perceived as someone extreme out groups, a source of contamination and corrupt therefore disgusting (). Preliminary research also suggests that disgust has a role in morality and that individuals' morality and disgust may be linked, particularly as it relates to sexuality (Blair, 2007). As theories are suggesting a relationship between BDSM fantasy, psychopathy and disgust sensitivity research has been carried out to determine if these theories are accurate.

Furthermore, as theory suggests there are differences in those that engage in atypical sexual behaviour and sexual fantasy, a further series of comparisons between the cohort in Chapter 4 and Chapter 5 has been conducted to determine if indeed there are differences in levels of psychopathy, disgust sensitivity based on self-report of BDSM fantasy and practice.

7.5 Rationale

The current study explores the relationship between psychopathic traits, BDSM fantasy and disgust sensitivity to determine if there is a relationship between these constructs.

Additionally, an examination how BDSM practitioners and those that merely engage in fantasy related to BDSM differ in terms of psychopathic trait levels and disgust sensitivity will also be examined to gain a better understanding of the factors that my underscore atypical fantasy and practice.

7.5.1 Study A:

There are three research hypotheses under investigation for Study A.

Hypothesis I: There be a statistically significant relationship between BDSM fantasy and psychopathic traits as measured by the PPI-R .

Hypothesis II: There will be a strong negative correlation between self-report of disgust sensitivity as measured by the DS-R and psychopathic traits as measured by the PPI-R as theory suggests there is an inverse relationship between psychopathy and aversive emotion.

Hypothesis III: There will be a strong negative correlation between self-report of disgust sensitivity as measured by the DS-R and BDSM fantasy as measured by the Sexual Activities Checklist (revised) as theory suggests that disgust moderates sexual fantasy and behaviour.

Study B:

There are two additional research hypotheses under investigation. Hypothesis IV; There will be a statistically significant difference in psychopathy scores as measured by the PPI-R between individuals who actively engage in BDSM and those that merely fantasise about it.

Hypothesis V: There will be a statistically significant difference in the self-report of disgust sensitivity with those that engage in BDSM activity reporting lower levels of disgust sensitivity when compared to those that merely fantasise about it.

7.5.2 Method for Study A

7.5.3 Participants

Participants were selected using internet and convenience self-selected sampling of University students that were asked to exclude themselves if they had been the victims of sexually based offenses were asked not to participate due to the sensitive nature of the research. Further, upon starting the study participants were asked if they identified themselves as active in the BDSM community; if they answered yes they were forwarded on to the previous study electronically via questionpro.com.

7.5.4 Apparatus:

PPI-R (Lilienfeld and Widows, 2005)

DS-R (Haidt, et al. 2007)

Sexual Activities Checklist (Nordling, 2006)

Questionpro.com

7.5.5 Procedure:

Potential participants were approached about possible participation via convenience sampling of students at the University as well as internet users on adult only websites. Participants were provided with a virtual informed consent when they accessed the survey website. If interested in completing the study they were prompted to tick boxes confirming they understood the nature and parameters of the study, that there data

would be treated as confidential and anonymous and that they could withdraw their data at any time or refuse to answer questions they did not wish to. Participants than completed the PPI-R, DS-R and the Sexual Activity Checklist. This was followed by a debrief where participants were provided details of the study, contact information for the researcher and again reminded of their right to withdraw from the study.

The assessments were scored according to the authors instructions and any participants who had responded inconsistently were removed from the data set. The Sexual Activity Checklist was scored using the values provided by the Likert scale. Essentially all responses were calculated based on how strongly someone endorsed a particular fantasy, if at all. A total score was than obtained that suggests global BDSM Fantasy. Precise scoring details are located in the Methodology Chapter.

7.6 Results

Prior to completing inferential statistics the Shapiro-Wilk Test of Normality was carried out determining that data was normally distributed and as data was deemed to be at plastic interval, it was determined that parametric testing would be appropriate for the data set.

Table 7-1 Descriptive Statistics for PPI-R, BDSM Fantasy and DS-R

	Age	**PPI-R**	**BDSM Fantasy**	**DS-R**
Male (=8)	26.71	62.25(10.33)	5.59(3.98)	62.25(14.08)
Female (=32)	28.12	67.5(6.65)	5.51(4.67)	67.75(14.26)

Correlations were carried out to explore the relationship between BDSM fantasy, psychopathic and disgust sensitivity had been conducted. Pearson's correlation was

carried out to determine if there is a significant positive correlation between self-reported BDSM fantasy and psychopathy as measured by the PPI-R. There was a weak positive correlation (r: .35, p<.05, N=40) that was statistically significant suggesting that there was a mild positive correlation between the presence of BDSM sexual fantasy and PPI-R scores. As per Benning's, et al. (2005) recommendation a further correlation was carried out to explore the two-factor structure associated with the PPI-R to examine how the two factors may differentially correlate with BDSM Fantasy. PPI-R1 and BDSM fantasy share a weak, positive, but non-significant correlation (r: .290, p>.05, N=40) and PPI-R 2 and BDSM fantasy also have weak, positive, but non-significant correlation (r: .282, p>05, N=40). suggesting that inconsistent with the literature both factors combined seemingly contribute to the correlation between PPI-R scores and BDSM fantasy. This is atypical of psychopathic trait based research as usually the two factors combined do not contribute to particular behaviours or affective features of psychopathy. Pearson's correlation was also carried out to determine if there was a significant negative correlation between self-reported disgust sensitivity and psychopathic traits as measured by the PPI-R. There was not a correlation between disgust sensitivity and psychopathic traits.(r: .096, p>.05, N=40). As Benning, et al. (2005) suggests that exploration of the two factor structure independently as global scores may obscure differences across the two factors, Pearson's Correlation was carried out for PPI-R1 and disgust sensitivity (r:.037, p>.05, N=40) which was not significant, and PPI-R 2 and disgust sensitivity (r:.073, p>.05, N=40), this too was not significant. And finally a Pearson's correlation was carried out to determine if there was a significant negative correlation between disgust sensitivity and self-reported BDSM fantasy. There was not a correlation between (r: .137 , p>.05, N:40) that was not statistically significant suggest there is not a relationship between disgust sensitivity and BDSM related fantasy.

Study B

Participants consist of the group from the study in the previous chapter as well as those from the current study that explores BDSM Fantasy, psychopathy and disgust sensitivity. The BDSM practitioners consist of There a total of 48 participants 33 Female (Mean age: 37.06), 15 Male (Mean Age: 40.73) For the Non BDSM practitioner condition there were 40 participants, 32 Female (Mean age: 26.7) and 8 Male (Mean age: 28.12).

A series of independent groups t-tests were carried out to determine if there was a statistically significant differences between psychopathy scores for BDSM practitioners (Mean: 65.27, SD: 7.87) and Non BDSM (Mean: 66.45, SD: 7.60). The results of the independent groups t-test (t: .710, df: 86, $p>.05$) indicating that there is no statistically significant difference in the groups scores. However an independent groups t-test that examined the if there is a statistically significant difference in levels of disgust sensitivity for BDSM practitioners (Mean: 57.3, SD: 13.21) and non-BDSM (Mean: 66.65, SD: 14.22) indicates that there is a statistically significant difference (t: 3.19, df: 86, $p<.01$) with BDSM practitioners reporting significantly lower disgust sensitivity scores than the non-BDSM participants.

7.7 Discussion for Study A and B

The findings of Study A suggest that psychopathic traits and BDSM fantasy are related. There was no relationship between reported disgust sensitivity and psychopathic trait scores nor was there was a relationship between BDSM fantasy and disgust sensitivity. This is inconsistent with the findings from the previous chapter that suggest that PPI-R scores and BDSM activity were unrelated. Interestingly, in Study B when BDSM fantasy participants were compared with practitioners the statistically significant difference that emerged between the groups was one of disgust sensitivity, not PPI-R scores. Psychopathic traits were not a significant factor in how these groups differ. In fact, while not statistically significant, the non-BDSM group had a slightly higher mean

score for the PPI-R than the BDSM practitioners. These findings are of particular interest because these results suggest that BDSM practitioners scored lower on a measure of psychopathic traits than those who do not engage or even fantasize much about BDSM activities. This is generally not consistent with theoretical assumptions that currently suggest that there will be a positive relationship between the two constructs primarily because of the assumption that individuals who are psychopathic are callous and self-centred, and lacking in empathy and individuals who engage in BDSM are likely to be quite similar as some researchers have suggested (Williams, et al. 2009). The claim that atypical sexual fantasy will lead to atypical behaviour in individuals who score higher on a measure of psychopathic traits requires further investigation, however, the previous research study confirmed that those who actively and admittedly engage in BDSM practice did not score any higher than those that merely fantasise about BDSM. What would be interesting is to examine what personality factors including specific factors related to psychopathy, may determine whether or not individuals actively engage in certain behaviours or merely fantasize about such. Particularly, Factor 2 of psychopathy which is more associated with anti-social personality construct and is often mediated by increased levels of anxiety and fear. It may be those that do not engage in BDSM behaviour may be less inclined to share their fantasies due to fears/anxieties about rejection/humiliation or judgment of their BDSM interests. Similarly, if individuals share more traits associated with Factor 2 of psychopathy, rather than Factor 1, the perceived or actual pain associated with some BDSM activities may prevent individuals from engaging in activities in activities they may otherwise find pleasurable due to their fear/apprehension about pain, in general. However, this is purely speculation at this point and a suggestion for further investigation. Again, examining the role of perceived pain by individuals who engage in BDSM fantasy but not behaviour in relation to various personality factors, in,

particular Factor 2 of psychopathy which is more anxiety/fear prone may prove particular useful.

These research findings are otherwise consistent with that of the previous study which suggests that there is not a particularly strong or statistically significant relationship between psychopathic traits and consensual BDSM be it behaviour or fantasy. Research into disgust sensitivity seems to be equivocal, however, as there were not statistically significant correlations within the groups reported behaviours or fantasies and disgust sensitivity. However between the BDSM fantasy and behaviour group, there was a statistically significant difference in self-reported disgust sensitivity which requires further consideration. Also, the role disgust plays may play in mediating the actual behaviours compared to the fantasies engaged in. That is to say that those who engage in BDSM fantasy but not behaviour may find something about the behaviour disgusting which is why they never cross the threshold from thought to behaviour. Perhaps it is a more conservative attitude towards sex, as previous research found that those who found homosexuality repulsive had more puritanical views of sex, in general ().

One curiosity that emerged from this research that is inconsistent with the outcomes of the systematic review and several other studies was that the correlation between BDSM fantasy and total PPI-R scores. BDSM fantasy did not load onto one of the two factor structures, but both seemingly in equal measure. This is not consistent with other research which suggests that the external correlates associated with psychopathic traits typically will load positively on to one factor and negatively onto another because the two factors, PPI-R 1 and PPI-R 2 are said to be uncorrelated. From a theoretical perspective this is difficult to explain as it not consistent with a multitude of research findings and may be the consequence of Type 1 error, however, further

research investigating the relationship between sexual fantasy and psychopathic traits needs to be explored in non-offending samples.

Further exploration of disgust sensitivity and its relationship to atypical sexual practice and fantasy needs to take place to determine what facets of disgust are most relevant to the development of attitudes and behaviours of a sexual nature. As mentioned in the previous chapter, research would benefit from a self-report tool that examines disgust sensitivity across domains that may be particularly relevant to the study of sexuality and morality and perhaps the DS-R is not the most appropriate tool even if it touches on some topics that may be relevant to BDSM.

While there are a number of limitations to these studies, these studies are novel in that they have helped to shed light on the theoretical relationship between psychopathic traits and atypical sexuality including sexual fantasy. These studies included a large female cohort, atypical of BDSM fantasy/practice research which often relies on male respondents almost exclusively. Additionally, this research has helped to shed light on the dimensions of disgust which may not be as relevant to the development of attitudes/behaviours of a sexual nature and this may help to inform future research that explores more precisely how dimensions of disgust may shape sexual behaviour.

As the Sexual Activity Checklist was scored quite differently for the two groups, making direct comparisons would not be appropriate, not only because of the differences in the scoring but also because one is reporting fantasy and the other actual behaviours which the fantasy group indicated they do not identify with. However, how those who fantasise about BDSM activities and how those that actually engage in the behaviours differ in terms of their sexual interests should be explored in depth. Understanding how these groups differ will help to shed light on sexual fantasy and behaviour research. BDSM research, both fantasy and behaviour would benefit from a formal protocol that examines these constructs in depth as the composite used for this

research provided information that was useful, it did not make it possible to draw direct comparisons between groups.

It would seem that when dealing with dimensional constructs such as psychopathy and disgust sensitivity, there is a bit of trial and error involved in developing a research protocol that examines the right dimensions under the appropriate conditions. This is important to keep in mind when developing research and analysing data, including the current research studies, that some of the findings may vary if other aspects of a particular construct are the focus. For example, it would appear the domains of disgust sensitivity, as measured by the DS-R are not directly related to BDSM sexual fantasy/practice, despite previous research suggesting they may be, and therefore may also not be directly related to psychopathic traits. However, other aspects of disgust sensitivity might be. Also, it would appear that individual differences seem to play a substantial role in the experience of disgust sensitivity across the research. Unlike other aversive stimuli that seem to share more common features across samples, disgust sensitivity seems to be more unique and variable among healthy participants.

A significant problem with the exploration of sexual fantasy or behaviour, regardless of type, is the private and intimate nature of fantasy. Participants must be willing and able to provide these details and often this proves extremely difficult as both offenders and non-offenders may be prone to socially desirable responding. Offenders, in particular, may be motivated to minimise the frequency and types of fantasy they engage in for fear of having this information used against them in legal proceedings. However, socially desirable responding is also a problem with a community sample as well. Many may fear appearing "deviant" by indicating they engage in certain types of fantasy or behaviour. This needs to be kept in mind when considering these research

findings. Participants may have been reluctant to share their private fantasies, particularly since BDSM is often viewed in a pejorative way by mainstream society. As this is often a problem this research was undertaken via the internet to afford participants additional privacy/anonymity in terms of their responses and it would seem that this proved fruitful for this research study. While the first study was hindered by the use of the internet, the subsequent internet based studies provided for fairly robust samples that were willing to share more intimate information than might have been obtained via more traditional research method.

Chapter 8. Discussion

In 2007, Mahmut et al. cautioned that there was far too great an emphasis on offender based psychopathy research and that more needed to be done to explore psychopathy in other samples. This seems to coincide with research and theory that supported a heterogeneous, dimensional construction of psychopathy rather than a unique taxon, however, his concerns were not known. In fact, Meehl (1990) voiced similar concerns when considering how often psychopathy was studies in clinical and forensic settings; rather than across samples. Meehl's (1990) argument was that the nomological network, the Cleckley model which eventually came to include Hare's contributions, did not exclude non-offenders, and that offending characteristics were not prototypical of psychopathy, therefore the research needed to better reflect the nomological network. In 2010 Skeem and Cooke again echoed these same concerns. Psychopathy research, theory and ultimately the nomological network were being subsumed by research that explores, not the 'true' nomological network of psychopathy, but rather suggests that the nomological network should reflect what the PCL-R measures and this is erroneous. Hare and colleagues (2010), did not disagree, however there was not

a solution proposed at that time. A subsequent meta-analysis by Miller and Lynam (2012) as well as the systematic review conducted herein demonstrate the problems with over-emphasising the traits associated with PCL-R rather than the nomological network of psychopathy. This includes ignoring personality traits of psychopathy as well as sub-types of psychopathy that are more adaptive than the criminal sub-type most often associated with the PCL-R.

What is currently conceptualized about psychopathy focuses on the anti-social traits and behaviours consistent with the PCL-R. The more high functioning elements of psychopathy, such as stress immunity, including a lack of anxiety or fear, as well as social adjustment, openness and extroversion are not considered in the research or are most often just the subject of external correlate analysis that confirm that stress immunity and anxiety are negatively correlated, for example. This can be said to be reflected in psychopathy research, as a whole, presently. Despite acknowledgement that psychopathy is a heterogeneous, dimensional construct the research emphasis tends to be on the traits and behaviours most closely associated with the PCL-R derived traits and behaviours, such as criminality, poor socialization, drug/alcohol abuse, violence, aggression and impulse control issues. There is much about psychopathy that remains unknown as a consequence. This lack of research and knowledge has provided the impetus for exploring psychopathic traits in groups other than offenders. Furthermore, the nomological network would seem to be in need of revision. This includes an examination of the external correlates such as neurocognitive deficits, and how they may differentially apply to samples of sub-types of psychopathy. What constitutes a prototypical psychopath may also require revision,

as the research seemingly supports the notion of sub-types that may be markedly different from one another in terms of presentation and severity that needs careful consideration. It would seem that there are prototypical sub-types, but not a unitary structure of psychopathy.

The purpose of this thesis was to address some of these issues including exploring psychopathic traits in females, as well as exploring some of the external correlates associated with psychopathy that have, to date, not been researched empirically. More specifically, how individuals who score higher on a measure of psychopathic traits may experience disgust sensitivity and if it is an attenuated experience, similar to how other aversive emotions are frequently reported as being. In addition, atypical sexuality in the form of consensual sadomasochism, BDSM, which was theorized to be more likely in non-offenders, similar to how non-consensual sadism appears to be more common in offending psychopaths has been explored.

8.1 Study I (Chapter 4)

The systematic review of the PPI and its derivatives was intended to determine if the PPI, PPI-R, considered the 'gold-standard' of self-report measures demonstrates construct validity by assessing systematically all available and appropriate research from 2005 when the PPI-R was published through August 2012. Not dissimilar to the findings of Miller and Lynam (2012) the results of the systematic review suggest that the PPI and derivatives may be a good measure of psychopathic traits. However, the PPI and PPI-R outperform the PPI-SF for measuring psychopathic traits, demonstrating validity and reliability whereas the PPI-SF is said to be less stable. This is particularly true when compared to the PPI, underperforms, whereas the PPI and PPI-R are said to be fairly consistent to each other in terms of the measurement of psychopathic traits and factor structure.

A number of the issues mentioned herein demonstrated the problem with focusing too stringently on one sub-type of psychopathy, the offender. Virtually all the studies included in the systematic review evaluated the PPI and derivatives not based entirely on the original nomological network but rather how well it correlates with features associated with the PCL-R. In particularly, PPI-R 2 was often touted as the factor that best measures psychopathic traits as it corresponds to well to the PCL-R traits, however, PPI-1 which explores factors not consistent with the PCL-R such a stress immunity and social dominance does not receive good reviews, in fact, Miller and Lynam, (2012) went so far as to suggest it does not measure traits associated with psychopathy, whereas, Grey, et al. (2011) argue that the PPI and derivatives measure a purer form of psychopathic traits more consistent with the nomological network proposed by the Cleckley/Hare model. Lilienfeld, et al. (2012) argue in their response to Miller and Lynam (2012) similar, that they have adhered to the original Cleckley/Hare model which is meant to be the nomological network for psychopathy and not what a particular assessment measures, that is faulty logical applied to the nomological network, essentially. Curiously, the other sub-scale Cold-heartedness, remains largely unreported on, other than to mention that it does not load on to the two factor structure and may require revision. It is unclear how this subscale impacts global scoring or if it is particularly useful for measuring psychopathic traits. It does demonstrate that while the PPI and PPI-R may be effective at measuring psychopathic traits, it does require revision.

The two-factor structure, Fearless Dominance and Impulsive Anti-sociality are said to correspond to the primary and secondary sub-types of psychopath, consequently providing further evidence for the heterogeneous, dimensional construct of psychopathy which has surely helped to raise the debate about the nomological network and the empirical measures used to measure it.

With these critiques in mind, Studies II, III and IV were conducted to explore some of the external correlates associated with psychopathic traits to in community samples in an effort to examine psychopathic traits samples other than offenders. Admittedly this required consideration of external correlates related directly to offending psychopaths such as the emotional dysfunction and dysregulation and how the combination of psychopathic traits, and possible emotional deficits may impact certain behaviours. As psychopathy is said to share features with sadism, particularly in offending samples, it was similarly explored from the consensual sadomasochism perspective to determine if external correlates that may apply to offenders might also apply to non-offenders.

8.2 Study II Emotional Stroop (Chapter 5)

The emotional Stroop study was exploratory and novel in that it examined possible relationship between disgust sensitivity in individuals who scored higher on a measure of psychopathy as well as their lower scoring confederates. At present research that explores aversive emotions has focused on fear and threat paradigms to the exclusion of disgust. Disgust based research is more typically conducted with individuals who experience anxiety related disorders so it was unknown how disgust and psychopathic traits may be related, if at all. The purpose of the study was to see if disgust, an aversive emotion, was similarly attenuated in individuals who scored higher on a measure of psychopathic traits. Additionally, as psychopathic individuals are said to engage in socially desirable responding, a crude assessment of the validity of the DS-R was conducted to determine if it individuals were prone to responding in socially desirable ways, rather than honestly about their experience of disgust.

The results of the emotional Stroop were fairly typical across other emotions including positive and neutral stimuli which typically do not result in larger response latencies. However, threat based emotionally valenced stimuli did result in response latencies across the sample and there was a statistically significant difference in low and

moderate scorers on the PPI-R response to threat based stimuli with lower scorers demonstrating significantly larger latencies. High scorers on the PPI-R, were not statistically significant when compared with low and moderate scorers interestingly. This may be due to enhanced response modulation or the ability to ignore meaning of the word and focus on the task that some individuals who score highly on measures of psychopathy exhibit, however. In terms of performance related to disgust, there were statistically significant differences for response time latencies or biases across the sample. This may be due to the fact that disgust is said to be not an automatic emotion and the Stroop may not be effective at picking up biases as it is said to be a measure of automaticity of attention. Further, disgust may not be attenuated in individuals who score higher on measures of psychopathy. Similarly, another issue with the design of the emotional Stroop, in particular, the word list utilized for the disgust condition had not been previously tested. Consequently, the words selected, may not be suitable for eliciting a disgust response or words may not be sufficient for eliciting a disgust response in otherwise healthy individuals. The relationship between disgust sensitivity and psychopathic traits remains largely unknown and requires further research and examination.

8.3 Study III and IV (Chapter 6 and 7)

Studies 3 and 4 explored the theorised relationships between psychopathic traits, disgust sensitivity and atypical sexual fantasy and practice in the form of BDSM. It has been suggested that individuals who demonstrate a preponderance of psychopathic traits are more inclined towards sadism due to their lack of empathy, cold-heartedness and callous nature. Features they are said to share with sadists. At present the continuum of behaviours that may comprise Sadism from consensual through to criminal remains poorly understood.

The results of Study 3 did not support the theory that psychopathic traits and BDSM activities are positively correlated. BDSM practitioners PPI-R scores were quite varied however. Their BDSM activities fairly consistent across the group. The lack of statistically significant correlation suggests that these constructs do not have a positive relationship. Similarly disgust sensitivity did not share a negative relationship with PPI-R scores. Surprisingly, disgust sensitivity was unrelated to BDSM practice. This is surprising because the domains of disgust sensitivity are, in some ways related to BDSM practice, including the incorporation of bodily fluids into various sexual activities. As such one would have expected an attenuated response to disgust, but that was not to be found. Again, individual differences in experience of disgust and BDSM practice are likely responsible for this. What was particularly interesting about this study is that disgust did not seem to have any bearing on behaviour which is not consistent with theory that suggests that disgust moderates sexual behaviour. What seems to be necessary is a more thorough examination of all the domains of disgust not just that may be relevant to a particular sub set of sexual practices. What would be particularly useful would be to explore the domains of disgust related to specific aspects of morality to see if there is a correlation between these constructs, as well as devising a measure of disgust directly related to sexuality to determine what dimensions of disgust are more appropriate to associate with moral and sexual transgressions or behaviours.

The findings for Study 4 were slightly different in that there was a positively correlation between BDSM fantasy and PPI-R scores with those scoring higher reporting more BDSM fantasies. Curiously when this relationship was explored further something unusual for psychopathic trait based research was found inconsistent with a substantial portion of the literature. Usually, the PPI-R 1 and PPI-R 2 are differentially associated with external correlates, however, in this case both seemed to be equally related, though not statistically significant on their own, to explain the positive

correlation between BDSM fantasy and PPI-R scores. Disgust sensitivity was not related to PPI-R scoring or BDSM fantasy however. What was particularly interesting, is that while disgust did not correlate with BDSM fantasy or practice, self-report measures of disgust demonstrated that there is a substantial difference in disgust sensitivity between those who engage in BDSM practices and those that merely fantasise about it. What this suggests is that disgust sensitivity may play a role in moderating sexual behaviours, but not appetites. Individuals may find something suitable for a fantasy but not put it into practice. This has potential implications offending sexual behaviours and recidivism. For example, exploring disgust sensitivity of rapists or paedophiles compared with those who report fantasies of rape or paedophilia but do not actually engage in such may provide some answers as to why some individuals go on to offend and others do not. Disgust sensitivity may be a contributing factor onto offending pathways that requires additional investigation.

The positive correlation between BDSM fantasy and PPI-R scores is consistent with previous research that suggests that there is a relationship between psychopathic traits and atypical sexuality. What is unclear is why this does not carry over to BDSM practitioners. For this reason, comparisons were drawn between the BDSM fantasy and activity groups. PPI-R scores between the groups were not statistically significant; however, the BDSM fantasy groups mean score was slightly higher than the BDSM Activity's score. What was of particular interest was that there was a statistically significant difference in the experience of disgust sensitivity across the two groups with BDSM fantasy group scoring much higher than BDSM practice group. This is consistent with research that suggests that those who engage in atypical sexual practices are likely to have an attenuated experience of disgust. This difference may suggest the reason for one group practicing and the other not doing so is that factors that underscore disgust, including sexual conservatism may influence whether or not individuals may act on fantasies they engage in. While someone may experience sexual

arousal or desire at the thought of certain sexual activities, putting them into practice may prove repugnant at some level which may help to explain why individuals who do not offend, but engage in atypical, even deviant sexual fantasy do not act upon them.

Exploration of the two factor structure of psychopathy and its relationship with disgust sensitivity may provide more understanding into the differences in those who engage in atypical sexual practices and those who merely fantasise about certain activities. Research that examines the relationship between the experience of pain and psychopathy may prove particularly fruitful. Pain is an aversive emotional experience, and as such, those who experience more Factor 1 traits associated with psychopathy may have an attenuated or even pleasurable experience of pain when compared to those who score higher on Factor 2 of psychopathic traits where fear, anxiety and shame are said to be more 'typical' than those who experience more Factor 1 traits. The fear of pain, and even the fear of rejection, or the shame associated with certain types of fantasies may inhibit some individuals with a preponderance of psychopathic traits from acting on their fantasies. Overall the results seem to suggest the relationship between psychopathy and BDSM, be it fantasy or practice is fairly limited and that other factors, including dimensions of disgust need to be explored in relationship to the experience and quality of sexual fantasy and practice to better understand the nature of sexual fantasy and practice, in general. Assuming that personality traits associated with psychopathy is primarily the reason for more atypical fantasy or practice seems to be flawed.

These studies were unique as the explored BDSM fantasy and practice in relationship to psychopathic traits and disgust sensitivity, none of which has received much

research attention previously. What is particularly unique about this research were the large number of female participants. BDSM research is most often conducted with male cohorts, almost exclusively. This combined with the exploration of facets of disgust sensitivity and psychopathic personality traits make this research particularly unique. Also, the outcomes of this research may have, in some small way, helped to contribute to the understanding of how disgust may moderate sexual behaviour across different samples. The research seems to suggest that while atypical sexual fantasy is less affected by disgust, atypical behaviours may be moderated by disgust, and this may include such facets of disgust as those dictated by sexual conservatism, cultural, social and even religious norms which should be addressed in future research.

In the introduction to this thesis there were several research problems outlined, including difficulty in defining constructs such as psychopathy, sadomasochism and disgust. What has emerged, interestingly, is that each of the constructs under investigation: psychopathic traits, disgust sensitivity and consensual sadomasochism all appear to be heterogeneous, dimensional constructs. How these heterogeneous constructs may or may not be related becomes more difficult to ascertain due to the heterogeneity across all three; while the results of these studies did not yield particularly powerful results they lay the foundation for further investigation into the manifestation and relationship between personality, emotion and behaviour.

As research into sub-clinical psychopathy often elicits concerns on the part of researchers attempting to identify the ideal participants, this research provides useful information for obtaining suitable participants for psychopathy based research. First, contrary to research that indicates only the lowest and higher scorers on measures of psychopathy should be included in research. These studies examined psychopathy from across the spectrum. And while research findings were not necessarily consistent with prior evidence this may be because a broader spectrum of low, moderate and

higher scorers have been used rather than just examining differences across the lowest and highest scorers on measures of psychopathy. These variances in psychopathic traits may be more reflective of the heterogeneous, dimensional construct of psychopathy. Further, research that examined the validity and reliability of the PPI and derivatives suggests that while not as effective at measuring psychopathic traits as the

PPI and PPI-R the PPI-SF may be used as a research screening tool to determine if a participant may be suitable for a particular type of study. For example if a researcher were interested in exploring the PPI-2 traits, they may pre-screen using the PPI-SF to determine if someone meets minimum requirements for research interest, saving both the researcher and potential participant some time. Due to the PPI-SF not performing consistently, however, it is advised that the PPI-SF be used more as a general screening too.

Understanding how and why psychopathic traits are often associated with atypical sexual practices and fantasy has also been explored by this research; specifically the relationship between BDSM and psychopathic traits. The emotional deficits associated with psychopathy are often suggested to be responsible for this relationship. In particular a callous, cold-hearted nature, coupled with a lack of empathy is believed to be the cause of this. However, this suggests lack of understanding regarding certain forms of consensual, albeit atypical sexual practices that needed to be addressed as well as the theoretical assumptions that emotional deficits may be responsible for presumed increased incidence of BDSM practice and fantasy. The purposes of studies contained in chapters 4 and 5 were intended to enhance understanding of BDSM as well as explore a potential relationship between an emotional deficits, in this case a lack of disgust sensitivity and BDSM practice and fantasy. While the research did not provide definitive results it has informed a number of areas of exploration. First, many

who engage in BDSM fantasy but not practice seem to score higher on the PPI-R. Though not statistically significant, these findings have led to queries about the aversive experience of pain, anxiety, fear and subclinical levels of secondary psychopathy that may need to be explored in greater detail. In fact, the very relationship between sexual gratification and pain requires extensive research and examination as currently there are virtually no theoretical explanations for this relationship. What little explanation has been offered does link the experience of childhood pain, illness and/or trauma with masturbatory coping mechanisms that for some have now conditioned one to experience pleasure when experience very specific forms of pain. This is largely anecdotal at present and there is no research that currently examines, in depth this potential relationship. And that leads to another avenue of research exploration; what is it about the quality, duration, administration and experience of particular forms of pain that will provide some with sexual gratification and other forms of pain do not. Individuals in the BDSM community are connoisseurs they are not indiscriminate about the types of pain, if any, they wish to experience and yet there is little to no research into why and what individual differences including personality traits and emotions facilitate this.

This research demonstrated a need for a comprehensive exploration of dimensional nature of disgust sensitivity as it applies to sexuality and morality. As theorists suggests there is a relationship between psychopathic personality, a lack of morality and a propensity towards atypical sexuality, more research is needed that explores precisely which facets of the dimensions of disgust may be responsible for directing morality and how they are related to traits associated with psychopathy. In particular, the development of an assessment that examines the dimensional construct of disgust as it applies to things such as sexual practice/taboos, as well as dimensions associated with morality would prove extremely beneficial. Similarly, the study of BDSM fantasy and practice would equally benefit from a comprehensive tool that examines these

complex phenomena. However it is acknowledged that this would be no easy task as BDSM is extremely heterogeneous and a tool that captures practice that incorporates the diversity found with the community will require extensive piloting and analyses. Also, examining the relationship between morality and sexuality must be done carefully. Suggesting that someone is amoral simply because they engage in an alternative sexual practice will lead to more harm than good.

Another problem that emerged from trying to gather data on such topics as atypical sexuality and, more pointedly disgust, was that participants were not keen to be subjected to disgust based stimuli regardless of the format, be it words or images. Future research that explores facets of disgust will need to keep in mind the difficulty in gaining participants, the types of stimuli to be presented and perhaps incentives that may motivate those who are ambivalent about participation without actually trying to coerce more squeamish individuals into participating in research they may find unpleasant

Research design and participant acquisition were key issues across the three of the four studies. As the internet continues to dominate information acquisition and processing, social sciences have explored the benefits and limitations of using the internet for research purposes. Social networking, dedicated survey/questionnaire hosting websites, and other forms of social media have provided a foundation for research, exploration and interaction with potential research participants. The use of the internet for research was both beneficial and incredibly detrimental to the progress of this research.

Conversely the use of the internet to seemed to be beneficial for the acquisition of participants for both the BDSM practitioner and fantasy studies. Participants were assured of total anonymity and confidentiality that traditional research may not afford

individuals. As a consequence, concerns about revealing fantasy or behaviour that may make someone field judged or maligned was diminished and participants seemed to feel more inclined to answer open and honestly about their experiences and fantasies.

A limitation of the research for all the studies were the reliance on fairly small samples sizes. Whilst most of the findings were non-significant, this may be due to the smaller, less representative samples that were available. Larger scale studies that can examine psychopathic traits, disgust sensitivity and atypical sexuality are necessary. And that is another interesting feature these constructs share. If one ignores the wealth of offender related research there is a lack of empirical research that examines this constructs independently as well as jointly. More research and inquiry is needed to determine the role disgust may play in sexuality, the role if disgust in moderating behaviour and what, if any role psychopathic traits may have to play in regards to both. Identifying psychopathic traits, BDSM practice and fantasy, and disgust sensitivity are remains problematic precisely because these are areas that require much further exploration. In particular, the dimensional construct of each, how to capture these constructions during research conditions and retain validity and reliability, proves difficult, particularly when these structures are both heterogeneous and dimensional.

There are a number of additional areas of exploration that may prove beneficial for understanding psychopathy and the incidence of associated affective and neurocognitive deficits. In particular, the relationship between psychopathy and the different types of empathy that have been identified require greater exploration across clinical and subclinical samples. How different types of empathy may or may not be adversely affected by psychopathic traits and if this influences behaviour is essential to understanding the construct of psychopathy as it is often assumed that empathy is

lacking in psychopaths. However, the understanding of empathy which also appears to have some dimensional structure requires additional research across the spectrum of not only psychopathy but normal personality.

Examining sex differences and psychopathic traits is another area that requires further investigation. How men and women differ in terms of psychopathic traits such as affective and neurocognitive deficits will be particularly important. One reason for this is brain structure, functioning and sex differences. Men and woman demonstrated different variations of psychopathic traits in research studies examined in the systematic review. How and why men and women differ with regards to psychopathic traits could prove particularly fruitful area of exploration.

Fleshing out the construct of psychopathy beyond the subclinical/clinical, offender/non offender, primary (Factor 1)/secondary (Factor 2) subtypes discussed by are not reflected in a cohesive nomological network is essential to understanding psychopathy as a whole. This requires much more research that examines the full spectrum of psychopathic traits across all available samples. Further, it requires cooperation on the part of experts for deciding how and what should be include in the nomological network of psychopathy. Currently there is a consensus on the Cleckley/Hare model but that model is in need of revision it would seem. Currently, it would appear an emphasis Factor 2 traits associated with psychopathy are related to the presupposed affective, neurocognitive and behavioural deficits associated with psychopathy while Factor 1 traits, of higher functioning, primary psychopaths go ignored.

While this research has provided an original contribution to research of psychopathic traits as well as a foundation for further exploration and examination of psychopathy, disgust sensitivity and BDSM practice and fantasy, in particular, it has also exposed some of issues in examining heterogeneous, dimensional constructs. This is further exacerbated by disagreement about the nomological network of psychopathy and sadism and how they may be constructed, diagnosed and treated. The emphasis of this research was on the non-clinical manifestations, however, the larger issues surrounding the clinical manifestations do impact research into all variations of these constructs. Gaining a better understanding of heterogeneity and dimensionality of traits associated with psychopathy and sadism is essential to understanding how these constructs may or may not be related. These issues are of great import and the impact of not having nomological frameworks that are consistent to work with has impacted adversely the course of research for both psychopathy and sadism.

One final area of exploration that would be particularly beneficial toward enhancing the understanding of psychopathy would be to explore the cross-cultural phenomena of psychopathy. Current research from Japan, Brazil, Sweden, the United States and United Kingdom, to name but a few countries, all suggest that psychopathy exists in all cultures. Understanding the manifestations and perceptions of these manifestations of psychopathy across different cultures may prove particularly useful. Of particular interest would be to see if the psychopath is viewed in particularly negative way by all cultures. If the 2 Factor Structure most often associated with psychopathy is consistent across cultures. Research from the systematic review suggests that this is not the case, however, only one study from Japan, demonstrated this difference. More research and examination of the cross cultural variations of psychopathic traits needs to be completed. Of particular interest how the traits and factors may be perceived in other

cultures. The traits associated with PPI-R 2 are referred to as anti-social and unpleasant, whereas PPI-R1 is considered adaptive, outgoing, even charming, albeit superficially. Cultural perceptions of these traits, and traits not yet considered by Western psychologists may be of particular import for understanding psychopathy.

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Appendix A

Word list adapted from Smith and Waterman (2004) and Price (2011).

Neutral	Aggression	Positive	Disgust
Door	Rage	Devotion	Bloody
Group	Anger	Affectionate	Corpse
Chair	Tear	Admire	Dirty
Telephone	Assault	Amuse	Rotten
Dog	Kick	Love	Fungus
Coat	Shout	Joy	Mucus
Sofa	Punch	Proud	Rot
Bag	Hate	Fond	Scum
Diary	Argue	Funny	Pee
Newspaper	Temper	Glad	Disease
Eat	Fight	Comfortable	Repulsive
Oven	Kill	Beloved	Vomit
Floor	Punish	Calm	Syphilis
Shopping	Annoyed	Peace	Stench
Umbrella	Guilt	Daring	Wounds
Windy	Scream	Cheerful	Pus
Radio	Crush	Warm	Ulcer
Painting	Slash	Protective	Toxic
Milk	Smash	Hope	Defecate
School	Cut	Lively	Decapitate

Appendix B

Systematic Review Tabulation Output

Statistics

Version

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	PPI	25	36.8	36.8	36.8
	PPI-R	28	41.2	41.2	77.9
	PPI-SF	14	20.6	20.6	98.5

Statistics

		Version	Sample	Sample Size	Study type
N	Valid	68	68	65	68
	Missing	0	0	3	0
Mean		1.8676	2.2647	319.9077	4.3529

Version

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	PPI	25	36.8	36.8	36.8
	PPI-R	28	41.2	41.2	77.9
	PPI-SF	14	20.6	20.6	98.5
	All	1	1.5	1.5	100.0
	Total	68	100.0	100.0	

Version

	Frequency	Percent	Valid Percent	Cumulative Percent

Valid	PPI	25	36.8	36.8	36.8
	PPI-R	28	41.2	41.2	77.9
	PPI-SF	14	20.6	20.6	98.5

Sample

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Student	30	44.1	44.1	44.1
	Offender	18	26.5	26.5	70.6
	Community	5	7.4	7.4	77.9
	Mixed	7	10.3	10.3	88.2
	Juvenile	4	5.9	5.9	94.1
	Psychiatric	3	4.4	4.4	98.5
	All	1	1.5	1.5	100.0
	Total	68	100.0	100.0	

Study type		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Correlation with other Psychopathy Assessments	4	5.9	5.9	5.9
	External Correlates	22	32.4	32.4	38.2
	Correlation with Normal Personality Assessments	1	1.5	1.5	39.7
	Factor Structure	4	5.9	5.9	45.6
	Combination	35	51.5	51.5	97.1
	Meta-analysis	1	1.5	1.5	98.5
	Reliability	1	1.5	1.5	100.0
	Total	68	100.0	100.0	

Appendix C

Normality Testing for Studies II, III, IV

Tests of Normality

	PPILevel	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
DisgustScale	Low (>45-59)	.133	16	.200*	.968	16	.800
	Moderate (60-69)	.166	12	.200*	.933	12	.418
	High (70+)	.151	12	.200*	.952	12	.673
TScore	Low (>45-59)	.287	16	.001	.770	16	.001
	Moderate (60-69)	.326	12	.001	.839	12	.027
	High (70+)	.200	12	.198	.948	12	.601
AverageDisgust	Low (>45-59)	.152	16	.200*	.948	16	.462
	Moderate (60-69)	.133	12	.200*	.946	12	.579
	High (70+)	.197	12	.200*	.913	12	.235
AverageNeutral	Low (>45-59)	.161	16	.200*	.931	16	.249
	Moderate (60-69)	.184	12	.200*	.917	12	.263
	High (70+)	.146	12	.200*	.953	12	.681
AveragePositive	Low (>45-59)	.129	16	.200*	.949	16	.478
	Moderate (60-69)	.212	12	.143	.927	12	.348
	High (70+)	.122	12	.200*	.949	12	.617
AverageAversive	Low (>45-59)	.149	16	.200*	.881	16	.040
	Moderate (60-69)	.168	12	.200*	.893	12	.131
	High (70+)	.144	12	.200*	.972	12	.934
DisgustBias	Low (>45-59)	.170	16	.200*	.935	16	.297
	Moderate (60-69)	.144	12	.200*	.945	12	.572
	High (70+)	.222	12	.105	.930	12	.381
PositiveBias	Low (>45-59)	.378	16	.000	.583	16	.000
	Moderate (60-69)	.161	12	.200*	.940	12	.500
	High (70+)	.256	12	.028	.793	12	.008
AversiveBias	Low (>45-59)	.123	16	.200*	.971	16	.854
	Moderate (60-69)	.192	12	.200*	.897	12	.144
	High (70+)	.131	12	.200*	.938	12	.477

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

Tests of Normality

	PPIRRanking	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.

	Low (>45-59)	.206	11	.200*	.871	11	.081
TotalDisgust	Moderate (60-69)	.176	25	.043	.944	25	.181
	High (70+)	.199	12	.200*	.888	12	.110
	Low (>45-59)	.234	11	.093	.874	11	.089
Tscore	Moderate (60-69)	.152	25	.139	.913	25	.035
	High (70+)	.153	12	.200*	.933	12	.412
	Low (>45-59)	.117	11	.200*	.953	11	.688
BDSMActivity	Moderate (60-69)	.127	25	.200*	.964	25	.500
	High (70+)	.178	12	.200*	.928	12	.356

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

Tests of Normality

	Sex	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
DisgustSensitivity	Female	.133	32	.162	.976	32	.689
	male	.160	8	.200*	.952	8	.728
TBDSMFantasy	Female	.156	32	.045	.847	32	.000
	male	.192	8	.200*	.925	8	.469
Tscoretotal	Female	.086	32	.200*	.960	32	.279
	male	.233	8	.200*	.900	8	.288

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

Appendix D

Statistical Outputs for Study II

Sex

Case Processing Summary

	Sex	Cases					
		Valid		Missing		Total	
		N	Percent	N	Percent	N	Percent
TScore	male	11	100.0%	0	0.0%	11	100.0%
	female	29	100.0%	0	0.0%	29	100.0%
DisgustScale	male	11	100.0%	0	0.0%	11	100.0%
	female	29	100.0%	0	0.0%	29	100.0%

Descriptives

	Sex		Statistic	Std. Error
TScore	male	Mean	59.5455	2.87422

	95% Confidence Interval for Mean	Lower Bound	53.1413	
		Upper Bound	65.9496	
	5% Trimmed Mean		59.5505	
	Median		56.0000	
	Variance		90.873	
	Std. Deviation		9.53272	
	Minimum		46.00	
	Maximum		73.00	
	Range		27.00	
	Interquartile Range		14.00	
	Skewness		.169	.661
	Kurtosis		-1.166	1.279
female	Mean		65.3448	1.66556
	95% Confidence Interval for Mean	Lower Bound	61.9331	
		Upper Bound	68.7566	
	5% Trimmed Mean		65.3831	
	Median		62.0000	
	Variance		80.448	

		Std. Deviation		8.96930	
		Minimum		50.00	
		Maximum		80.00	
		Range		30.00	
		Interquartile Range		17.00	
		Skewness		.023	.434
		Kurtosis		-1.305	.845
		Mean		44.0909	2.54935
		95% Confidence Interval for Mean	Lower Bound	38.4106	
			Upper Bound	49.7712	
		5% Trimmed Mean		44.2677	
		Median		44.0000	
DisgustScale	male	Variance		71.491	
		Std. Deviation		8.45523	
		Minimum		29.00	
		Maximum		56.00	
		Range		27.00	

Descriptives

	Sex			Statistic	Std. Error
DisgustScale	male	Interquartile Range		12.00	
		Skewness		-.191	.661
		Kurtosis		-.479	1.279
		Mean		56.9655	1.98547
		95% Confidence Interval for Mean	Lower Bound	52.8985	
			Upper Bound	61.0326	
		5% Trimmed Mean		56.7107	
		Median		58.0000	
		Variance		114.320	
	female	Std. Deviation		10.69206	
		Minimum		39.00	
		Maximum		82.00	
		Range		43.00	
		Interquartile Range		16.50	
		Skewness		.180	.434
		Kurtosis		-.371	.845

Case Processing Summary

	PPILevel	Cases				
		Valid		Missing		Total
		N	Percent	N	Percent	N
AverageDisgust	Low (>45-59)	16	100.0%	0	0.0%	16
	Moderate (60-69)	12	100.0%	0	0.0%	12
	High (70+)	12	100.0%	0	0.0%	12
AverageNeutral	Low (>45-59)	16	100.0%	0	0.0%	16
	Moderate (60-69)	12	100.0%	0	0.0%	12
	High (70+)	12	100.0%	0	0.0%	12
AveragePositive	Low (>45-59)	16	100.0%	0	0.0%	16
	Moderate (60-69)	12	100.0%	0	0.0%	12
	High (70+)	12	100.0%	0	0.0%	12
AverageAversive	Low (>45-59)	16	100.0%	0	0.0%	16
	Moderate (60-69)	12	100.0%	0	0.0%	12
	High (70+)	12	100.0%	0	0.0%	12

Case Processing Summary

PPILevel	Cases
	Total
	Percent

	Low (>45-59)	100.0%
AverageDisgust	Moderate (60-69)	100.0%
	High (70+)	100.0%
	Low (>45-59)	100.0%
AverageNeutral	Moderate (60-69)	100.0%
	High (70+)	100.0%
	Low (>45-59)	100.0%
AveragePositive	Moderate (60-69)	100.0%
	High (70+)	100.0%
	Low (>45-59)	100.0%
AverageAversive	Moderate (60-69)	100.0%
	High (70+)	100.0%

Descriptives

	PPILevel			Statistic
AverageDisgust	Low (>45-59)	Mean		937.6250
		95% Confidence Interval for Mean	Lower Bound	910.4662
			Upper Bound	964.7838
		5% Trimmed Mean		938.7500
		Median		938.0000
		Variance		2597.717
		Std. Deviation		50.96780
		Minimum		833.00
		Maximum		1022.00
		Range		189.00

	Interquartile Range		50.75
	Skewness		-.428
	Kurtosis		.536
	Mean		919.5833
	95% Confidence Interval for Mean	Lower Bound	890.6574
		Upper Bound	948.5093
	5% Trimmed Mean		920.7037
	Median		922.5000
	Variance		2072.629
Moderate (60-69)	Std. Deviation		45.52613
	Minimum		839.00
	Maximum		980.00
	Range		141.00
	Interquartile Range		78.50
	Skewness		-.348
	Kurtosis		-.619
	Mean		939.5833
	95% Confidence Interval for Mean	Lower Bound	923.3880
		Upper Bound	955.7787
	5% Trimmed Mean		938.4259
	Median		936.0000
High (70+)	Variance		649.720
	Std. Deviation		25.48960
	Minimum		907.00
	Maximum		993.00
	Range		86.00

Descriptives

	PPILevel			Std. Error
AverageDisgust	Low (>45-59)	Mean		12.74195
		95% Confidence Interval for Mean	Lower Bound	
			Upper Bound	
		5% Trimmed Mean		
		Median		
		Variance		
		Std. Deviation		
		Minimum		
		Maximum		
		Range		
		Interquartile Range		
		Skewness		.564
		Kurtosis		1.091
	Moderate (60-69)	Mean		13.14226
		95% Confidence Interval for Mean	Lower Bound	
			Upper Bound	

	5% Trimmed Mean		
	Median		
	Variance		
	Std. Deviation		
	Minimum		
	Maximum		
	Range		
	Interquartile Range		
	Skewness		.637
	Kurtosis		1.232
	Mean		7.35821
	95% Confidence Interval for Mean	Lower Bound	
		Upper Bound	
	5% Trimmed Mean		
High (70+)	Median		
	Variance		
	Std. Deviation		
	Minimum		

		Maximum		
		Range		

Descriptives

	PPILevel			Statistic
AverageDisgust	High (70+)	Interquartile Range		28.75
		Skewness		1.016
		Kurtosis		.576
		Mean		921.7500
		95% Confidence Interval for Mean	Lower Bound	898.7470
			Upper Bound	944.7530
		5% Trimmed Mean		923.1667
		Median		924.0000
		Variance		1863.533
	Low (>45-59)	Std. Deviation		43.16866
		Minimum		835.00
AverageNeutral		Maximum		983.00
		Range		148.00
		Interquartile Range		51.25
		Skewness		-.719
		Kurtosis		.323
		Mean		892.0833
		95% Confidence Interval for Mean	Lower Bound	864.1922
	Moderate (60-69)		Upper Bound	919.9745
		5% Trimmed Mean		892.2037

		Median		898.0000
		Variance		1926.992
		Std. Deviation		43.89752
		Minimum		826.00
		Maximum		956.00
		Range		130.00
		Interquartile Range		84.25
		Skewness		-.353
		Kurtosis		-1.246
		Mean		912.1667
		95% Confidence Interval for Mean	Lower Bound	892.6061
			Upper Bound	931.7273
	High (70+)	5% Trimmed Mean		911.7963
		Median		917.5000
		Variance		947.788
		Std. Deviation		30.78616

Descriptives

	PPILevel			Std. Error
AverageDisgust	High (70+)	Interquartile Range		
		Skewness		.637
		Kurtosis		1.232
		Mean		10.79217
AverageNeutral	Low (>45-59)	95% Confidence Interval for Mean	Lower Bound	
			Upper Bound	

	5% Trimmed Mean		
	Median		
	Variance		
	Std. Deviation		
	Minimum		
	Maximum		
	Range		
	Interquartile Range		
	Skewness		.564
	Kurtosis		1.091
	Mean		12.67212
	95% Confidence Interval for Mean	Lower Bound	
		Upper Bound	
Moderate (60-69)	5% Trimmed Mean		
	Median		
	Variance		
	Std. Deviation		
	Minimum		
	Maximum		

		Range		
		Interquartile Range		
		Skewness		.637
		Kurtosis		1.232
		Mean		8.88720
		95% Confidence Interval for Mean	Lower Bound	
			Upper Bound	
	High (70+)	5% Trimmed Mean		
		Median		
		Variance		
		Std. Deviation		

Descriptives

	PPILevel			Statistic
AverageNeutral	High (70+)	Minimum		868.00
		Maximum		963.00
		Range		95.00
		Interquartile Range		58.00
		Skewness		-.043
		Kurtosis		-1.060
AveragePositive	Low (>45-59)	Mean		925.8750
		95% Confidence Interval for Mean	Lower Bound	901.8691

	Mean	Upper Bound	949.8809
	5% Trimmed Mean		926.5278
	Median		920.5000
	Variance		2029.583
	Std. Deviation		45.05090
	Minimum		841.00
	Maximum		999.00
	Range		158.00
	Interquartile Range		61.50
	Skewness		-.316
	Kurtosis		-.045
Moderate (60-69)	Mean		895.1667
	95% Confidence Interval for Mean	Lower Bound	868.1560
		Upper Bound	922.1773
	5% Trimmed Mean		895.4074
	Median		906.5000
	Variance		1807.242
	Std. Deviation		42.51167
	Minimum		827.00
	Maximum		959.00
	Range		132.00
	Interquartile Range		73.75
	Skewness		-.372
	Kurtosis		-1.044
High (70+)	Mean		913.0833
	95% Confidence Interval for Mean	Lower Bound	894.0002
		Upper Bound	932.1665
	5% Trimmed Mean		912.8148

Descriptives

	PPILevel			Std. Error
AverageNeutral	High (70+)	Minimum		
		Maximum		
		Range		
		Interquartile Range		
		Skewness		.637
		Kurtosis		1.232
		Mean		11.26272
		95% Confidence Interval for Mean	Lower Bound	
			Upper Bound	
		5% Trimmed Mean		
		Median		
AveragePositive	Low (>45-59)	Variance		
		Std. Deviation		
		Minimum		
		Maximum		
		Range		

	Interquartile Range		
	Skewness		.564
	Kurtosis		1.091
	Mean		12.27206
	95% Confidence Interval for Mean	Lower Bound	
		Upper Bound	
	5% Trimmed Mean		
	Median		
	Variance		
Moderate (60-69)	Std. Deviation		
	Minimum		
	Maximum		
	Range		
	Interquartile Range		
	Skewness		.637
	Kurtosis		1.232
	Mean		8.67027
	95% Confidence Interval for Mean	Lower Bound	
High (70+)		Upper Bound	
	5% Trimmed Mean		

Descriptives

	PPILevel			Statistic
AveragePositive	High (70+)	Median		917.5000
		Variance		902.083
		Std. Deviation		30.03470
		Minimum		870.00
		Maximum		961.00
		Range		91.00
		Interquartile Range		57.75
		Skewness		-.102
		Kurtosis		-1.084
		Mean		982.7500
		95% Confidence Interval for Mean	Lower Bound	964.3790
			Upper Bound	1001.1210
		5% Trimmed Mean		984.7222
		Median		988.5000
		Variance		1188.600
	Low (>45-59)	Std. Deviation		34.47608
		Minimum		910.00
AverageAversive		Maximum		1020.00
		Range		110.00
		Interquartile Range		41.50
		Skewness		-1.007
		Kurtosis		.109
		Mean		943.3333
	Moderate (60-69)	95% Confidence Interval for Mean	Lower Bound	913.5462
			Upper Bound	973.1204

		5% Trimmed Mean	944.2593
		Median	951.5000
		Variance	2197.879
		Std. Deviation	46.88154
		Minimum	872.00
		Maximum	998.00
		Range	126.00
		Interquartile Range	99.25
		Skewness	-.345
		Kurtosis	-1.282
	High (70+)	Mean	953.4167

Descriptives

	PPILevel		Std. Error
AveragePositive	High (70+)	Median	
		Variance	
		Std. Deviation	
		Minimum	
		Maximum	
		Range	
		Interquartile Range	
		Skewness	.637
		Kurtosis	1.232

		Mean		8.61902
		95% Confidence Interval for Mean	Lower Bound	
			Upper Bound	
		5% Trimmed Mean		
		Median		
		Variance		
	Low (>45-59)	Std. Deviation		
		Minimum		
		Maximum		
AverageAversive		Range		
		Interquartile Range		
		Skewness		.564
		Kurtosis		1.091
		Mean		13.53353
		95% Confidence Interval for Mean	Lower Bound	
			Upper Bound	
	Moderate (60-69)	5% Trimmed Mean		
		Median		
		Variance		

		Std. Deviation		
		Minimum		
		Maximum		
		Range		
		Interquartile Range		
		Skewness		.637
		Kurtosis		1.232
	High (70+)	Mean		6.03457

Descriptives

	PPILevel			Statistic
AverageAversive	High (70+)	95% Confidence Interval for Mean	Lower Bound	940.1347
			Upper Bound	966.6987
		5% Trimmed Mean		953.1852
		Median		954.0000
		Variance		436.992
		Std. Deviation		20.90436
		Minimum		920.00
		Maximum		991.00
		Range		71.00
		Interquartile Range		36.75
		Skewness		.071
		Kurtosis		-.606

Descriptives

	PPILevel			Std. Error
AverageAversive	High (70+)	95% Confidence Interval for Mean	Lower Bound	
			Upper Bound	
		5% Trimmed Mean		
		Median		
		Variance		
		Std. Deviation		
		Minimum		
		Maximum		
		Range		
		Interquartile Range		
		Skewness		.637
		Kurtosis		1.232

ANOVA

	Sum of Squares	df	Mean Square	F

AverageDisgust	Between Groups	3020.817	2	1510.408	.811
	Within Groups	68911.583	37	1862.475	
	Total	71932.400	39		
AverageNeutral	Between Groups	6117.392	2	3058.696	1.900
	Within Groups	59575.583	37	1610.151	
	Total	65692.975	39		
AveragePositive	Between Groups	6467.442	2	3233.721	1.986
	Within Groups	60246.333	37	1628.279	
	Total	66713.775	39		
AverageAversive	Between Groups	11953.792	2	5976.896	4.724
	Within Groups	46812.583	37	1265.205	
	Total	58766.375	39		

ANOVA

		Sig.
AverageDisgust	Between Groups	.452
	Within Groups	
	Total	
AverageNeutral	Between Groups	.164
	Within Groups	

AveragePositive	Total	
	Between Groups	.152
	Within Groups	
	Total	
AverageAversive	Between Groups	.015
	Within Groups	
	Total	

Post Hoc Tests

Multiple Comparisons

Tukey HSD

Dependent Variable	(I) PPILevel	(J) PPILevel	Mean Difference (I-J)	Std. Error	Sig.
AverageDisgust	Low (>45-59)	Moderate (60-69)	18.04167	16.48062	.523
		High (70+)	-1.95833	16.48062	.992
	Moderate (60-69)	Low (>45-59)	-18.04167	16.48062	.523
		High (70+)	-20.00000	17.61853	.499

	High (70+)	Low (>45-59)	1.95833	16.48062	.992
		Moderate (60-69)	20.00000	17.61853	.499
	Low (>45-59)	Moderate (60-69)	29.66667	15.32363	.143
		High (70+)	9.58333	15.32363	.807
AverageNeutral	Moderate (60-69)	Low (>45-59)	-29.66667	15.32363	.143
		High (70+)	-20.08333	16.38165	.446
	High (70+)	Low (>45-59)	-9.58333	15.32363	.807
		Moderate (60-69)	20.08333	16.38165	.446
	Low (>45-59)	Moderate (60-69)	30.70833	15.40965	.128
		High (70+)	12.79167	15.40965	.687
AveragePositive	Moderate (60-69)	Low (>45-59)	-30.70833	15.40965	.128
		High (70+)	-17.91667	16.47361	.528
	High (70+)	Low (>45-59)	-12.79167	15.40965	.687
		Moderate (60-69)	17.91667	16.47361	.528
	Low (>45-59)	Moderate (60-69)	39.41667*	13.58341	.017
		High (70+)	29.33333	13.58341	.092
AverageAversive	Moderate (60-69)	Low (>45-59)	-39.41667*	13.58341	.017
		High (70+)	-10.08333	14.52128	.768
	High (70+)	Low (>45-59)	-29.33333	13.58341	.092
		Moderate (60-69)	10.08333	14.52128	.768

Multiple Comparisons

Tukey HSD

Dependent Variable	(I) PPILevel	(J) PPILevel	95% Confidence Interval	
			Lower Bound	Upper Bound
AverageDisgust	Low (>45-59)	Moderate (60-69)	-22.1955	58.2789
		High (70+)	-42.1955	38.2789

	Moderate (60-69)	Low (>45-59)	-58.2789	22.1955
		High (70+)	-63.0154	23.0154
	High (70+)	Low (>45-59)	-38.2789	42.1955
		Moderate (60-69)	-23.0154	63.0154
	Low (>45-59)	Moderate (60-69)	-7.7458	67.0791
		High (70+)	-27.8291	46.9958
AverageNeutral	Moderate (60-69)	Low (>45-59)	-67.0791	7.7458
		High (70+)	-60.0789	19.9122
	High (70+)	Low (>45-59)	-46.9958	27.8291
		Moderate (60-69)	-19.9122	60.0789
	Low (>45-59)	Moderate (60-69)	-6.9141	68.3308
		High (70+)	-24.8308	50.4141
AveragePositive	Moderate (60-69)	Low (>45-59)	-68.3308	6.9141
		High (70+)	-58.1367	22.3034
	High (70+)	Low (>45-59)	-50.4141	24.8308
		Moderate (60-69)	-22.3034	58.1367
	Low (>45-59)	Moderate (60-69)	6.2530*	72.5804
		High (70+)	-3.8304	62.4970
AverageAversive	Moderate (60-69)	Low (>45-59)	-72.5804*	-6.2530
		High (70+)	-45.5368	25.3701
	High (70+)	Low (>45-59)	-62.4970	3.8304
		Moderate (60-69)	-25.3701	45.5368

*. The mean difference is significant at the 0.05 level.

Homogeneous Subsets

AverageDisgust

Tukey HSD

PPILevel	N	Subset for alpha = 0.05
		1
Moderate (60-69)	12	919.5833
Low (>45-59)	16	937.6250
High (70+)	12	939.5833
Sig.		.469

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 13.091.

b. The group sizes are unequal. The harmonic mean of the group sizes is used. Type I error levels are not guaranteed.

AverageNeutral

Tukey HSD

PPILevel	N	Subset for alpha = 0.05
		1

Moderate (60-69)	12	892.0833
High (70+)	12	912.1667
Low (>45-59)	16	921.7500
Sig.		.155

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 13.091.

b. The group sizes are unequal. The harmonic mean of the group sizes is used. Type I error levels are not guaranteed.

AveragePositive

Tukey HSD

PPILevel	N	Subset for alpha = 0.05
		1
Moderate (60-69)	12	895.1667
High (70+)	12	913.0833
Low (>45-59)	16	925.8750
Sig.		.140

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 13.091.

b. The group sizes are unequal. The harmonic mean of the group sizes is used. Type I error levels are not guaranteed.

AverageAversive

Tukey HSD

PPILevel	N	Subset for alpha = 0.05	
		1	2
Moderate (60-69)	12	943.3333	
High (70+)	12	953.4167	953.4167
Low (>45-59)	16		982.7500
Sig.		.750	.102

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 13.091.

b. The group sizes are unequal. The harmonic mean of the group sizes is used. Type I error levels are not guaranteed.

PPILevel

Case Processing Summary

	PPILevel	Cases					
		Valid		Missing		Total	
		N	Percent	N	Percent	N	Percent
DisgustBias	Low (>45-59)	16	100.0%	0	0.0%	16	100.0%
	Moderate (60-69)	12	100.0%	0	0.0%	12	100.0%
	High (70+)	12	100.0%	0	0.0%	12	100.0%
PositiveBias	Low (>45-59)	16	100.0%	0	0.0%	16	100.0%
	Moderate (60-69)	12	100.0%	0	0.0%	12	100.0%
	High (70+)	12	100.0%	0	0.0%	12	100.0%
AversiveBias	Low (>45-59)	16	100.0%	0	0.0%	16	100.0%
	Moderate (60-69)	12	100.0%	0	0.0%	12	100.0%
	High (70+)	12	100.0%	0	0.0%	12	100.0%

Descriptives

	PPILevel			Statistic	Std. Error
DisgustBias	Low (>45-59)	Mean		15.8750	6.34289
		95% Confidence Interval for Mean	Lower Bound	2.3554	
			Upper Bound	29.3946	
		5% Trimmed Mean		17.0833	

	Median		11.5000	
	Variance		643.717	
	Std. Deviation		25.37157	
	Minimum		-41.00	
	Maximum		51.00	
	Range		92.00	
	Interquartile Range		41.25	
	Skewness		-.386	.564
	Kurtosis		.033	1.091
	Mean		27.5000	4.50337
	95% Confidence Interval for Mean	Lower Bound	17.5882	
		Upper Bound	37.4118	
	5% Trimmed Mean		27.6111	
Moderate (60-69)	Median		26.5000	
	Variance		243.364	
	Std. Deviation		15.60012	
	Minimum		3.00	
	Maximum		50.00	

		Range		47.00	
		Interquartile Range		27.25	
		Skewness		.036	.637
		Kurtosis		-.898	1.232
		Mean		27.4167	5.33919
		95% Confidence Interval for Mean	Lower Bound	15.6652	
			Upper Bound	39.1681	
		5% Trimmed Mean		27.9630	
		Median		31.0000	
	High (70+)	Variance		342.083	
		Std. Deviation		18.49549	
		Minimum		-7.00	
		Maximum		52.00	
		Range		59.00	

Descriptives

	PPILevel		Statistic	Std. Error
DisgustBias	High (70+)	Interquartile Range	35.75	
		Skewness	-.601	.637

		Kurtosis		-.620	1.232
		Mean		4.1250	4.78964
		95% Confidence Interval for Mean	Lower Bound	-6.0839	
			Upper Bound	14.3339	
		5% Trimmed Mean		1.5278	
		Median		1.5000	
		Variance		367.050	
	Low (>45-59)	Std. Deviation		19.15855	
		Minimum		-17.00	
		Maximum		72.00	
PositiveBias		Range		89.00	
		Interquartile Range		9.75	
		Skewness		3.243	.564
		Kurtosis		12.164	1.091
		Mean		3.0833	1.56891
		95% Confidence Interval for Mean	Lower Bound	-.3698	
			Upper Bound	6.5365	
	Moderate (60-69)	5% Trimmed Mean		3.1481	
		Median		3.0000	
		Variance		29.538	

		Std. Deviation		5.43488
		Minimum		-6.00
		Maximum		11.00
		Range		17.00
		Interquartile Range		8.00
		Skewness		-.185
		Kurtosis		-.640
		Mean		.9167
		95% Confidence Interval for Mean	Lower Bound	-.9886
			Upper Bound	2.8220
		5% Trimmed Mean		.9630
		Median		2.5000
		Variance		8.992
		Std. Deviation		2.99874

Descriptives

	PPILevel		Statistic	Std. Error
PositiveBias	High (70+)	Minimum	-3.00	
		Maximum	4.00	

		Range		7.00	
		Interquartile Range		5.75	
		Skewness		-.317	.637
		Kurtosis		-2.052	1.232
		Mean		61.0000	6.37116
		95% Confidence Interval for Mean	Lower Bound	47.4202	
			Upper Bound	74.5798	
		5% Trimmed Mean		61.2222	
		Median		59.0000	
		Variance		649.467	
	Low (>45-59)	Std. Deviation		25.48464	
AversiveBias		Minimum		14.00	
		Maximum		104.00	
		Range		90.00	
		Interquartile Range		36.75	
		Skewness		-.204	.564
		Kurtosis		-.489	1.091
		Mean		51.2500	7.04544
		95% Confidence Interval for Mean	Lower Bound	35.7431	
	Moderate (60-69)		Upper Bound	66.7569	

		5% Trimmed Mean	49.8333	
		Median	44.0000	
		Variance	595.659	
		Std. Deviation	24.40613	
		Minimum	26.00	
		Maximum	102.00	
		Range	76.00	
		Interquartile Range	37.00	
		Skewness	.976	.637
		Kurtosis	.110	1.232
		Mean	41.2500	6.76681
	High (70+)	95% Confidence Interval for Mean — Lower Bound	26.3563	
		95% Confidence Interval for Mean — Upper Bound	56.1437	
		5% Trimmed Mean	40.4444	

Descriptives

	PPILevel		Statistic	Std. Error
AversiveBias	High (70+)	Median	42.0000	
		Variance	549.477	

	Std. Deviation	23.44093	
	Minimum	13.00	
	Maximum	84.00	
	Range	71.00	
	Interquartile Range	43.75	
	Skewness	.348	.637
	Kurtosis	-.951	1.232

ANOVA

		Sum of Squares	df	Mean Square	F
AverageDisgust	Between Groups	3020.817	2	1510.408	.811
	Within Groups	68911.583	37	1862.475	
	Total	71932.400	39		
AverageNeutral	Between Groups	6117.392	2	3058.696	1.900
	Within Groups	59575.583	37	1610.151	
	Total	65692.975	39		
AveragePositive	Between Groups	6467.442	2	3233.721	1.986
	Within Groups	60246.333	37	1628.279	

	Total	66713.775	39		
AverageAversive	Between Groups	11953.792	2	5976.896	4.724
	Within Groups	46812.583	37	1265.205	
	Total	58766.375	39		

ANOVA

		Sig.
AverageDisgust	Between Groups	.452
	Within Groups	
	Total	
AverageNeutral	Between Groups	.164
	Within Groups	
	Total	
AveragePositive	Between Groups	.152
	Within Groups	
	Total	
AverageAversive	Between Groups	.015
	Within Groups	
	Total	

Post Hoc Tests

Multiple Comparisons

Tukey HSD

Dependent Variable	(I) PPILevel	(J) PPILevel	Mean Difference (I-J)	Std. Error	Sig.
AverageDisgust	Low (>45-59)	Moderate (60-69)	18.04167	16.48062	.523
		High (70+)	-1.95833	16.48062	.992
	Moderate (60-69)	Low (>45-59)	-18.04167	16.48062	.523
		High (70+)	-20.00000	17.61853	.499
	High (70+)	Low (>45-59)	1.95833	16.48062	.992
		Moderate (60-69)	20.00000	17.61853	.499
AverageNeutral	Low (>45-59)	Moderate (60-69)	29.66667	15.32363	.143
		High (70+)	9.58333	15.32363	.807
	Moderate (60-69)	Low (>45-59)	-29.66667	15.32363	.143
		High (70+)	-20.08333	16.38165	.446
	High (70+)	Low (>45-59)	-9.58333	15.32363	.807
		Moderate (60-69)	20.08333	16.38165	.446
AveragePositive	Low (>45-59)	Moderate (60-69)	30.70833	15.40965	.128
		High (70+)	12.79167	15.40965	.687
	Moderate (60-69)	Low (>45-59)	-30.70833	15.40965	.128
		High (70+)	-17.91667	16.47361	.528

	High (70+)	Low (>45-59)	-12.79167	15.40965	.687
		Moderate (60-69)	17.91667	16.47361	.528
	Low (>45-59)	Moderate (60-69)	39.41667*	13.58341	.017
		High (70+)	29.33333	13.58341	.092
AverageAversive	Moderate (60-69)	Low (>45-59)	-39.41667*	13.58341	.017
		High (70+)	-10.08333	14.52128	.768
	High (70+)	Low (>45-59)	-29.33333	13.58341	.092
		Moderate (60-69)	10.08333	14.52128	.768

Multiple Comparisons

Tukey HSD

Dependent Variable	(I) PPILevel	(J) PPILevel	95% Confidence Interval	
			Lower Bound	Upper Bound
AverageDisgust	Low (>45-59)	Moderate (60-69)	-22.1955	58.2789
		High (70+)	-42.1955	38.2789
	Moderate (60-69)	Low (>45-59)	-58.2789	22.1955
		High (70+)	-63.0154	23.0154
	High (70+)	Low (>45-59)	-38.2789	42.1955
		Moderate (60-69)	-23.0154	63.0154
AverageNeutral	Low (>45-59)	Moderate (60-69)	-7.7458	67.0791
		High (70+)	-27.8291	46.9958
	Moderate (60-69)	Low (>45-59)	-67.0791	7.7458
		High (70+)	-60.0789	19.9122
	High (70+)	Low (>45-59)	-46.9958	27.8291
		Moderate (60-69)	-19.9122	60.0789
AveragePositive	Low (>45-59)	Moderate (60-69)	-6.9141	68.3308
		High (70+)	-24.8308	50.4141

	Moderate (60-69)	Low (>45-59)	-68.3308	6.9141
		High (70+)	-58.1367	22.3034
	High (70+)	Low (>45-59)	-50.4141	24.8308
		Moderate (60-69)	-22.3034	58.1367
	Low (>45-59)	Moderate (60-69)	6.2530*	72.5804
		High (70+)	-3.8304	62.4970
AverageAversive	Moderate (60-69)	Low (>45-59)	-72.5804*	-6.2530
		High (70+)	-45.5368	25.3701
	High (70+)	Low (>45-59)	-62.4970	3.8304
		Moderate (60-69)	-25.3701	45.5368

*. The mean difference is significant at the 0.05 level.

Homogeneous Subsets

AverageDisgust

Tukey HSD

PPILevel	N	Subset for alpha = 0.05
		1
Moderate (60-69)	12	919.5833

Low (>45-59)	16	937.6250
High (70+)	12	939.5833
Sig.		.469

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 13.091.

b. The group sizes are unequal. The harmonic mean of the group sizes is used. Type I error levels are not guaranteed.

AverageNeutral

Tukey HSD

PPILevel	N	Subset for alpha = 0.05
		1
Moderate (60-69)	12	892.0833
High (70+)	12	912.1667
Low (>45-59)	16	921.7500
Sig.		.155

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 13.091.

b. The group sizes are unequal. The harmonic mean of the group sizes is used. Type I error levels are not guaranteed.

AveragePositive

Tukey HSD

PPILevel	N	Subset for alpha = 0.05
		1
Moderate (60-69)	12	895.1667
High (70+)	12	913.0833
Low (>45-59)	16	925.8750
Sig.		.140

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 13.091.

b. The group sizes are unequal. The harmonic mean of the group sizes is used. Type I error levels are not guaranteed.

AverageAversive

Tukey HSD

PPILevel	N	Subset for alpha = 0.05	
		1	2
Moderate (60-69)	12	943.3333	
High (70+)	12	953.4167	953.4167
Low (>45-59)	16		982.7500

Sig.		.750	.102

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 13.091.

b. The group sizes are unequal. The harmonic mean of the group sizes is used. Type I error levels are not guaranteed.

Appendix E

Statistical Outputs for Study III

Sex

Case Processing Summary

	Sex	Cases					
		Valid		Missing		Total	
		N	Percent	N	Percent	N	Percent
Age	Female	33	100.0%	0	0.0%	33	100.0%
	male	15	100.0%	0	0.0%	15	100.0%
Tscore	Female	33	100.0%	0	0.0%	33	100.0%
	male	15	100.0%	0	0.0%	15	100.0%
TotalDisgust	Female	33	100.0%	0	0.0%	33	100.0%
	male	15	100.0%	0	0.0%	15	100.0%
BDSMActivity	Female	33	100.0%	0	0.0%	33	100.0%
	male	15	100.0%	0	0.0%	15	100.0%

Descriptives

	Sex			Statistic	Std. Error
Age	Female	Mean		37.6061	1.96751
		95% Confidence Interval for Mean	Lower Bound	33.5984	
			Upper Bound	41.6137	
		5% Trimmed Mean		37.2071	
		Median		38.0000	
		Variance		127.746	
		Std. Deviation		11.30249	
		Minimum		21.00	
		Maximum		61.00	
		Range		40.00	
		Interquartile Range		19.00	
		Skewness		.473	.409
		Kurtosis		-.673	.798
	male	Mean		40.7333	3.50165
		95% Confidence Interval for Mean	Lower Bound	33.2230	
			Upper Bound	48.2436	
		5% Trimmed Mean		40.4815	

		Median		47.0000	
		Variance		183.924	
		Std. Deviation		13.56185	
		Minimum		22.00	
		Maximum		64.00	
		Range		42.00	
		Interquartile Range		25.00	
		Skewness		-.034	.580
		Kurtosis		-1.317	1.121
		Mean		67.6970	1.31749
		95% Confidence Interval for Mean	Lower Bound	65.0133	
			Upper Bound	70.3806	
		5% Trimmed Mean		67.4512	
		Median		68.0000	
Tscore	Female	Variance		57.280	
		Std. Deviation		7.56838	
		Minimum		55.00	
		Maximum		86.00	
		Range		31.00	

Descriptives

	Sex			Statistic	Std. Error
Tscore	Female	Interquartile Range		12.00	
		Skewness		.427	.409
		Kurtosis		-.205	.798
		Mean		59.9333	1.48153
		95% Confidence Interval for Mean	Lower Bound	56.7558	
			Upper Bound	63.1109	
		5% Trimmed Mean		59.8148	
		Median		60.0000	
		Variance		32.924	
	male	Std. Deviation		5.73793	
		Minimum		51.00	
		Maximum		71.00	
		Range		20.00	
		Interquartile Range		7.00	
		Skewness		.061	.580
		Kurtosis		-.467	1.121
TotalDisgust	Female	Mean		59.3939	2.27550

		95% Confidence Interval for Mean	Lower Bound	54.7589
			Upper Bound	64.0290
		5% Trimmed Mean		59.2054
		Median		60.0000
		Variance		170.871
		Std. Deviation		13.07177
		Minimum		34.00
		Maximum		87.00
		Range		53.00
		Interquartile Range		18.00
		Skewness		.173
		Kurtosis		-.390
male		Mean		52.6667
		95% Confidence Interval for Mean	Lower Bound	45.6037
			Upper Bound	59.7296
		5% Trimmed Mean		52.5741
		Median		50.0000
		Variance		162.667
		Std. Deviation		12.75408

Descriptives

	Sex			Statistic	Std. Error
TotalDisgust	male	Minimum		35.00	
		Maximum		72.00	
		Range		37.00	
		Interquartile Range		23.00	
		Skewness		.124	.580
		Kurtosis		-1.183	1.121
		Mean		26.8182	1.21110
		95% Confidence Interval for Mean	Lower Bound	24.3512	
			Upper Bound	29.2851	
		5% Trimmed Mean		27.1768	
		Median		28.0000	
		Variance		48.403	
BDSMActivity	Female	Std. Deviation		6.95726	
		Minimum		8.00	
		Maximum		38.00	
		Range		30.00	
		Interquartile Range		9.00	

		Skewness		-.822	.409
		Kurtosis		.646	.798
		Mean		25.2667	1.43582
		95% Confidence Interval for Mean	Lower Bound	22.1871	
			Upper Bound	28.3462	
		5% Trimmed Mean		25.4074	
		Median		27.0000	
		Variance		30.924	
	male	Std. Deviation		5.56092	
		Minimum		15.00	
		Maximum		33.00	
		Range		18.00	
		Interquartile Range		9.00	
		Skewness		-.483	.580
		Kurtosis		-.734	1.121

PPIRRanking

Case Processing Summary

	PPIRRanking	Cases					
		Valid		Missing		Total	
		N	Percent	N	Percent	N	Percent
TotalDisgust	Low (>45-59)	11	100.0%	0	0.0%	11	100.0%
	Moderate (60-69)	25	100.0%	0	0.0%	25	100.0%
	High (70+)	12	100.0%	0	0.0%	12	100.0%
BDSMActivity	Low (>45-59)	11	100.0%	0	0.0%	11	100.0%
	Moderate (60-69)	25	100.0%	0	0.0%	25	100.0%
	High (70+)	12	100.0%	0	0.0%	12	100.0%

Descriptives

	PPIRRanking			Statistic	Std. Error
TotalDisgust	Low (>45-59)	Mean		56.7273	3.88725
		95% Confidence Interval for Mean	Lower Bound	48.0659	
			Upper Bound	65.3886	
		5% Trimmed Mean		57.0859	
		Median		60.0000	

		Variance		166.218	
		Std. Deviation		12.89256	
		Minimum		35.00	
		Maximum		72.00	
		Range		37.00	
		Interquartile Range		24.00	
		Skewness		-.818	.661
		Kurtosis		-.803	1.279
		Mean		57.2400	2.71433
		95% Confidence Interval for Mean	Lower Bound	51.6379	
			Upper Bound	62.8421	
		5% Trimmed Mean		56.9000	
		Median		55.0000	
	Moderate (60-69)	Variance		184.190	
		Std. Deviation		13.57166	
		Minimum		34.00	
		Maximum		87.00	
		Range		53.00	

		Interquartile Range		17.50	
		Skewness		.581	.464
		Kurtosis		.175	.902
		Mean		57.9167	4.00843
		95% Confidence Interval for Mean	Lower Bound	49.0942	
			Upper Bound	66.7392	
		5% Trimmed Mean		57.8519	
		Median		62.5000	
	High (70+)	Variance		192.811	
		Std. Deviation		13.88563	
		Minimum		40.00	
		Maximum		77.00	
		Range		37.00	

Descriptives

	PPIRRanking		Statistic	Std. Error
TotalDisgust	High (70+)	Interquartile Range	26.00	
		Skewness	-.073	.637
		Kurtosis	-1.695	1.232
BDSMActivity	Low (>45-59)	Mean	25.2727	1.71141

	95% Confidence Interval for Mean	Lower Bound	21.4595	
		Upper Bound	29.0860	
	5% Trimmed Mean		25.3586	
	Median		25.0000	
	Variance		32.218	
	Std. Deviation		5.67611	
	Minimum		16.00	
	Maximum		33.00	
	Range		17.00	
	Interquartile Range		9.00	
	Skewness		-.351	.661
	Kurtosis		-.855	1.279
	Mean		25.8800	1.56239
	95% Confidence Interval for Mean	Lower Bound	22.6554	
		Upper Bound	29.1046	
Moderate (60-69)	5% Trimmed Mean		26.1667	
	Median		28.0000	
	Variance		61.027	
	Std. Deviation		7.81196	

		Minimum	8.00	
		Maximum	38.00	
		Range	30.00	
		Interquartile Range	11.00	
		Skewness	-.556	.464
		Kurtosis	-.211	.902
		Mean	28.2500	1.09493
		95% Confidence Interval for Mean — Lower Bound	25.8401	
		95% Confidence Interval for Mean — Upper Bound	30.6599	
		5% Trimmed Mean	28.2222	
		Median	29.0000	
		Variance	14.386	
		Std. Deviation	3.79294	

Descriptives

	PPIRRanking		Statistic	Std. Error
BDSMActivity	High (70+)	Minimum	23.00	
		Maximum	34.00	
		Range	11.00	

	Interquartile Range	7.25	
	Skewness	-.124	.637
	Kurtosis	-1.398	1.232

Correlations

		Tscore	TotalDisgust
Tscore	Pearson Correlation	1	.079
	Sig. (2-tailed)		.593
	N	48	48
TotalDisgust	Pearson Correlation	.079	1
	Sig. (2-tailed)	.593	
	N	48	48

Correlations

		TFearless	TotalDisgust
TFearless	Pearson Correlation	1	.062
	Sig. (2-tailed)		.677
	N	48	48
TotalDisgust	Pearson Correlation	.062	1
	Sig. (2-tailed)	.677	
	N	48	48

Correlations

		TotalDisgust	TSelfcentered
TotalDisgust	Pearson Correlation	1	.096
	Sig. (2-tailed)		.517
	N	48	48
TSelfcentered	Pearson Correlation	.096	1
	Sig. (2-tailed)	.517	
	N	48	48

Correlations

		BDSMActivity	TotalDisgust
BDSMActivity	Pearson Correlation	1	-.129
	Sig. (2-tailed)		.381
	N	48	48
TotalDisgust	Pearson Correlation	-.129	1
	Sig. (2-tailed)	.381	
	N	48	48

Correlations

		BDSMActivity	TSelfcentered
BDSMActivity	Pearson Correlation	1	.259
	Sig. (2-tailed)		.076
	N	48	48
TSelfcentered	Pearson Correlation	.259	1
	Sig. (2-tailed)	.076	
	N	48	48

Correlations

		BDSMActivity	Tscore
BDSMActivity	Pearson Correlation	1	.209
	Sig. (2-tailed)		.153
	N	48	48
Tscore	Pearson Correlation	.209	1
	Sig. (2-tailed)	.153	
	N	48	48

Correlations

		BDSMActivity	TFearless
BDSMActivity	Pearson Correlation	1	.114
	Sig. (2-tailed)		.442
	N	48	48
TFearless	Pearson Correlation	.114	1
	Sig. (2-tailed)	.442	
	N	48	48

Descriptives

BDSMActivity

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean
					Lower Bound
Low (>45-59)	11	25.2727	5.67611	1.71141	21.4595
Moderate (60-69)	25	25.8800	7.81196	1.56239	22.6554
High (70+)	12	28.2500	3.79294	1.09493	25.8401
Total	48	26.3333	6.53414	.94312	24.4360

Descriptives

BDSMActivity

	95% Confidence Interval for Mean	Minimum	Maximum
	Upper Bound		
Low (>45-59)	29.0860	16.00	33.00
Moderate (60-69)	29.1046	8.00	38.00
High (70+)	30.6599	23.00	34.00
Total	28.2307	8.00	38.00

ANOVA

BDSMActivity

	Sum of Squares	df	Mean Square	F	Sig.

Between Groups	61.595	2	30.797	.713	.496
Within Groups	1945.072	45	43.224		
Total	2006.667	47			

Multiple Comparisons

Dependent Variable: BDSMActivity

Tukey HSD

(I) PPIRRanking	(J) PPIRRanking	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval
					Lower Bound
Low (>45-59)	Moderate (60-69)	-.60727	2.37874	.965	-6.3724
	High (70+)	-2.97727	2.74434	.528	-9.6285
Moderate (60-69)	Low (>45-59)	.60727	2.37874	.965	-5.1579
	High (70+)	-2.37000	2.30888	.564	-7.9658
High (70+)	Low (>45-59)	2.97727	2.74434	.528	-3.6740
	Moderate (60-69)	2.37000	2.30888	.564	-3.2258

Multiple Comparisons

Dependent Variable: BDSMActivity

Tukey HSD

(I) PPIRRanking	(J) PPIRRanking	95% Confidence Interval
		Upper Bound
Low (>45-59)	Moderate (60-69)	5.1579
	High (70+)	3.6740
Moderate (60-69)	Low (>45-59)	6.3724
	High (70+)	3.2258
High (70+)	Low (>45-59)	9.6285
	Moderate (60-69)	7.9658

BDSMActivity

Tukey HSD

PPIRRanking	N	Subset for alpha = 0.05
		1
Low (>45-59)	11	25.2727
Moderate (60-69)	25	25.8800
High (70+)	12	28.2500
Sig.		.460

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 14.003.

b. The group sizes are unequal. The harmonic mean of the group sizes is used. Type I error levels are not guaranteed.

Descriptives

TotalDisgust

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean
					Lower Bound
Low (>45-59)	11	56.7273	12.89256	3.88725	48.0659
Moderate (60-69)	25	57.2400	13.57166	2.71433	51.6379
High (70+)	12	57.9167	13.88563	4.00843	49.0942
Total	48	57.2917	13.21823	1.90789	53.4535

Descriptives

TotalDisgust

	95% Confidence Interval for Mean	Minimum	Maximum
	Upper Bound		
Low (>45-59)	65.3886	35.00	72.00
Moderate (60-69)	62.8421	34.00	87.00
High (70+)	66.7392	40.00	77.00
Total	61.1298	34.00	87.00

ANOVA

TotalDisgust

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	8.258	2	4.129	.023	.978
Within Groups	8203.658	45	182.304		
Total	8211.917	47			

Post Hoc Tests

Multiple Comparisons

Dependent Variable: TotalDisgust

Tukey HSD

(I) PPIRRanking	(J) PPIRRanking	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval
					Lower Bound
Low (>45-59)	Moderate (60-69)	-.51273	4.88520	.994	-12.3526
	High (70+)	-1.18939	5.63605	.976	-14.8490
Moderate (60-69)	Low (>45-59)	.51273	4.88520	.994	-11.3271
	High (70+)	-.67667	4.74174	.989	-12.1688
High (70+)	Low (>45-59)	1.18939	5.63605	.976	-12.4702
	Moderate (60-69)	.67667	4.74174	.989	-10.8155

Multiple Comparisons

Dependent Variable: TotalDisgust

Tukey HSD

(I) PPIRRanking	(J) PPIRRanking	95% Confidence Interval
		Upper Bound
Low (>45-59)	Moderate (60-69)	11.3271
	High (70+)	12.4702
Moderate (60-69)	Low (>45-59)	12.3526
	High (70+)	10.8155
High (70+)	Low (>45-59)	14.8490
	Moderate (60-69)	12.1688

TotalDisgust

Tukey HSD

PPIRRanking	N	Subset for alpha = 0.05
		1
Low (>45-59)	11	56.7273
Moderate (60-69)	25	57.2400
High (70+)	12	57.9167
Sig.		.971

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 14.003.

b. The group sizes are unequal. The harmonic mean of the group sizes is used. Type I error levels are not guaranteed.

Appendix F

Outputs for Study IV

Descriptives

	Sex			Statistic	Std. Error
Age	Female	Mean		26.7188	1.75014
		95% Confidence Interval for Mean	Lower Bound	23.1493	
			Upper Bound	30.2882	
		5% Trimmed Mean		25.4375	
		Median		21.5000	
		Variance		98.015	
		Std. Deviation		9.90026	
		Minimum		19.00	

		Maximum		65.00	
		Range		46.00	
		Interquartile Range		11.00	
		Skewness		2.215	.414
		Kurtosis		6.247	.809
		Mean		28.1250	3.84725
		95% Confidence Interval for Mean	Lower Bound	19.0277	
			Upper Bound	37.2223	
		5% Trimmed Mean		27.6389	
		Median		21.0000	
		Variance		118.411	
	male	Std. Deviation		10.88167	
		Minimum		20.00	
		Maximum		45.00	
		Range		25.00	
		Interquartile Range		20.00	
		Skewness		.784	.752
		Kurtosis		-1.648	1.481
Tscoretotal	Female	Mean		67.5000	1.15877

		95% Confidence Interval for Mean	Lower Bound	65.1367
			Upper Bound	69.8633
		5% Trimmed Mean		67.5417
		Median		68.0000
		Variance		42.968
		Std. Deviation		6.55498
		Minimum		56.00
		Maximum		79.00
		Range		23.00

Descriptives

	Sex			Statistic	Std. Error
Tscoretotal	Female	Interquartile Range		8.75	
		Skewness		-.197	.414
		Kurtosis		-.756	.809
		Mean		62.2500	3.65352
		95% Confidence Interval for Mean	Lower Bound	53.6108	
			Upper Bound	70.8892	
		5% Trimmed Mean		62.0000	

		Median		61.0000	
		Variance		106.786	
		Std. Deviation		10.33372	
		Minimum		46.00	
		Maximum		83.00	
		Range		37.00	
		Interquartile Range		7.75	
		Skewness		.784	.752
		Kurtosis		2.800	1.481
		Mean		5.5172	.82686
		95% Confidence Interval for Mean	Lower Bound	3.8308	
			Upper Bound	7.2036	
		5% Trimmed Mean		5.0299	
		Median		4.3250	
TBDSMFantasy	Female	Variance		21.878	
		Std. Deviation		4.67743	
		Minimum		.30	
		Maximum		22.45	
		Range		22.15	

		Interquartile Range		6.00	
		Skewness		1.756	.414
		Kurtosis		4.311	.809
		Mean		5.5938	1.40879
		95% Confidence Interval for Mean	Lower Bound	2.2625	
			Upper Bound	8.9250	
	male	5% Trimmed Mean		5.5958	
		Median		5.5000	
		Variance		15.877	
		Std. Deviation		3.98465	

Descriptives

	Sex		Statistic	Std. Error
TBDSMFantasy	male	Minimum	.30	
		Maximum	10.85	
		Range	10.55	
		Interquartile Range	7.50	
		Skewness	.026	.752
		Kurtosis	-1.838	1.481

Case Processing Summary

	Sex	Cases					
		Valid		Missing		Total	
		N	Percent	N	Percent	N	Percent
DisgustSensitivity	Female	32	100.0%	0	0.0%	32	100.0%
	male	8	100.0%	0	0.0%	8	100.0%

Descriptives

	Sex			Statistic	Std. Error
DisgustSensitivity	Female	Mean		67.7500	2.52128
		95% Confidence Interval for Mean	Lower Bound	62.6078	
			Upper Bound	72.8922	
		5% Trimmed Mean		67.6667	
		Median		68.5000	
		Variance		203.419	
		Std. Deviation		14.26252	
		Minimum		40.00	
		Maximum		97.00	

		Range		57.00	
		Interquartile Range		20.25	
		Skewness		.209	.414
		Kurtosis		-.268	.809
		Mean		62.2500	4.98121
		95% Confidence Interval for Mean	Lower Bound	50.4713	
			Upper Bound	74.0287	
		5% Trimmed Mean		61.8333	
		Median		59.5000	
		Variance		198.500	
	male	Std. Deviation		14.08900	
		Minimum		45.00	
		Maximum		87.00	
		Range		42.00	
		Interquartile Range		23.75	
		Skewness		.715	.752
		Kurtosis		-.156	1.481

Correlations

		Tscoretotal	DisgustSensitivity
Tscoretotal	Pearson Correlation	1	.096
	Sig. (2-tailed)		.556
	N	40	40
DisgustSensitivity	Pearson Correlation	.096	1
	Sig. (2-tailed)	.556	
	N	40	40

Correlations

		DisgustSensitivity	TSelfcentered
DisgustSensitivity	Pearson Correlation	1	.073
	Sig. (2-tailed)		.654
	N	40	40
TSelfcentered	Pearson Correlation	.073	1
	Sig. (2-tailed)	.654	
	N	40	40

Correlations

		DisgustSensitivity	Tfearless
DisgustSensitivity	Pearson Correlation	1	.037
	Sig. (2-tailed)		.821
	N	40	40
Tfearless	Pearson Correlation	.037	1
	Sig. (2-tailed)	.821	
	N	40	40

Correlations

		TBDSMFantasy	DisgustSensitivity
TBDSMFantasy	Pearson Correlation	1	.137
	Sig. (2-tailed)		.401
	N	40	40
DisgustSensitivity	Pearson Correlation	.137	1
	Sig. (2-tailed)	.401	
	N	40	40

Correlations

		Tscoretotal	TBDSMFantasy
Tscoretotal	Pearson Correlation	1	.350*
	Sig. (2-tailed)		.027
	N	40	40
TBDSMFantasy	Pearson Correlation	.350*	1
	Sig. (2-tailed)	.027	
	N	40	40

*. Correlation is significant at the 0.05 level (2-tailed).

Correlations

		TBDSMFantasy	TSelfcentered
TBDSMFantasy	Pearson Correlation	1	.290
	Sig. (2-tailed)		.070
	N	40	40
TSelfcentered	Pearson Correlation	.290	1
	Sig. (2-tailed)	.070	
	N	40	40

Correlations

		TBDSMFantasy	Tfearless
TBDSMFantasy	Pearson Correlation	1	.282
	Sig. (2-tailed)		.077
	N	40	40
Tfearless	Pearson Correlation	.282	1
	Sig. (2-tailed)	.077	
	N	40	40

Descriptives

TBDSMFantasy

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean
					Lower Bound
Low (>45-59)	7	3.7214	1.93366	.73086	1.9331
Moderate (60-69)	17	4.6000	3.59739	.87250	2.7504
High (70+)	16	7.3156	5.60535	1.40134	4.3287
Total	40	5.5325	4.49902	.71136	4.0936

Descriptives

TBDSMFantasy

	95% Confidence Interval for Mean	Minimum	Maximum
	Upper Bound		
Low (>45-59)	5.5098	1.05	7.40
Moderate (60-69)	6.4496	.30	10.85
High (70+)	10.3025	.30	22.45

Total	6.9714	.30	22.45

ANOVA

TBDSMFantasy

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	88.615	2	44.307	2.339	.110
Within Groups	700.793	37	18.940		
Total	789.408	39			

Multiple Comparisons

Dependent Variable: TBDSMFantasy

Tukey HSD

(I) PPIRRanking	(J) PPIRRanking	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval
					Lower Bound
Low (>45-59)	Moderate (60-69)	-.87857	1.95446	.895	-5.6503
	High (70+)	-3.59420	1.97219	.176	-8.4093
Moderate (60-69)	Low (>45-59)	.87857	1.95446	.895	-3.8932
	High (70+)	-2.71562	1.51589	.186	-6.4166
High (70+)	Low (>45-59)	3.59420	1.97219	.176	-1.2209
	Moderate (60-69)	2.71562	1.51589	.186	-.9854

Multiple Comparisons

Dependent Variable: TBDSMFantasy

Tukey HSD

(I) PPIRRanking	(J) PPIRRanking	95% Confidence Interval
		Upper Bound
Low (>45-59)	Moderate (60-69)	3.8932
	High (70+)	1.2209
Moderate (60-69)	Low (>45-59)	5.6503
	High (70+)	.9854
High (70+)	Low (>45-59)	8.4093
	Moderate (60-69)	6.4166

TBDSMFantasy

Tukey HSD

PPIRRanking	N	Subset for alpha = 0.05
		1
Low (>45-59)	7	3.7214
Moderate (60-69)	17	4.6000
High (70+)	16	7.3156
Sig.		.134

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 11.356.

b. The group sizes are unequal. The harmonic mean of the group sizes is used. Type I error levels are not guaranteed.